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THE

ILLUSTRATED ANNUAL

REGISTER OF RURAL AFFAIRS

AND

CULTIVATOR ALMANAC,

FOR THE YEAR 1864,

CONTAINING PRACTICAL

SUGGESTIONS FOR THE FARMER AND HORTICULTURIST,

EMBELLISHED WITH ABOUT

One Hundred and Thirty Beautiful Engravings.

By J. J. THOMAS,

AUTHOR OF THE "AMERICAN FRUIT CULTURIST," AND "FARM IMPLEMENTS,"
ASSOCIATE EDITOR OF THE "COUNTRY GENTLEMAN" AND "CULTIVATOR."

ALBANY, N. Y.

LUTHER TUCKER & SON.

1864.

Publishers' Advertisement.

THE ILLUSTRATED ANNUAL REGISTER OF RURAL AFFAIRS has now been so long before the public that few words are necessary with reference to its design and scope. While the contents of its successive numbers are, in some degree, continuous in their character, each forms a separate work by itself. It is issued in advance of the commencement of each year, and furnishes, together with the usual Calendar Pages of an Almanac, a series of chapters upon subjects of Rural interest—largely embellished with Engravings, eminently plain and PRACTICAL in their nature, and serving to illustrate in a concise and attractive way the advances we are making in Agriculture and Horticulture—including, also, the Household Economy of the Farmer—from year to year.

The Lead'ng Article in the Number of the ANNUAL REGISTER for 1864, entitled "Doing Work in its Season," presents in fact a Calendar of Farm Operations for the Year, and is one of the most useful and suggestive papers yet published. Many valuable hints on "Road Making" are given in the paper devoted to that subject. A complete account of the "Cheese Factories" now in successful operation in Oneida county, with full details of the processes employed, is one of the features of the present Number; and, as a whole, it will be found worthy, we trust, of the same general approval which has been accorded to its predecessors.

Among the articles in previous numbers of the ANNUAL REGISTER, for which there is now frequent inquiry, we may refer to the following:

DESIGNS for Country Dwellings, Farm Houses and Working Men's Cottages, in Nos. for 1855, 1856, 1857, 1858, 1859, 1860 and 1861
INJURIOUS INSECTS, by Dr. FITCH, in No. for 1863.
ARCHITECTURAL TERMS, in No. for 1863.
BARNS AND FARM BUILDINGS, in No. for 1862.
BALLOON FRAMES, in No. for 1862.
GRASSES AND VEGETABLE PHYSIOLOGY, in No. for 1862.
LIGHTNING RODS, in No. for 1862.
POULTRY MANAGEMENT, in No. for 1861.
WEEDS and their Destruction, in No. for 1861.
ORNAMENTAL PLANTING, in No. for 1863.
THOMAS' Invaluable Essay upon FARM MANAGEMENT, in No. for 1859.
UNDER DRAINING, in No. for 1859.
A COMPLETE COUNTRY HOME, in No. for 1859.
RUSTIC SEATS, &c., in No. for 1857.
DOCTORING SICK ANIMALS, in No. for 1857.
DESCRIPTION OF SELECT FRUITS, of all kinds, in No. for 1856.

Either of the previous Numbers may at any time be had separately, by mail, post paid, upon inclosing 25 cents in a letter to the Publishers, LUTHER TUCKER & SON, ALBANY, N. Y. The nine Numbers, from 1855 to 1863, inclusive, are also published upon heavier and finer paper, in three volumes, with new Index and Title Page for each, (the Calendar Pages and Advertisements omitted,) of which a notice will be found on a succeeding page. The price of these three volumes is $3.75, (by mail, post paid,) or $1.25 each, sold separately. Complete sets of the ANNUAL REGISTER in cheap form, as originally published—Ten Numbers in all, paper covers—will be sent to any address for $2, post paid.

INDEX OF No. 10, FOR 1864.

ILLUSTRATIONS.

"RURAL AFFAIRS."

A New Edition of the Nine Numbers of the Annual Register from 1855 to 1863, inclusive, is now ready, under the simple and comprehensive title of **Rural Affairs.** In this edition the Calendar and Advertising Pages of each year are omitted, and larger, finer and heavier paper employed—the whole comprised in Three Handsome and Uniform Volumes of over 300 pages each, well bound in Muslin, at $1.25 each, sold separately or together, as may be desired, and sent postage pre-paid at this price to any part of the Union. They contain

OVER THIRTEEN HUNDRED ENGRAVINGS,

And we subjoin a brief Abstract of their Contents to show the scope embraced, although but a very incomplete idea can be conveyed of their variety and extent within the limited space here at command—including in their range, as will be seen, both Agriculture and Horticulture—Country Houses and Farm Buildings—Domestic Animals and Farm Implements—whatever, in fact, may be embraced under the above Title:—

VOLUME ONE.

Four Hundred and Forty Illustrations.

Country Dwellings.—Fifteen Designs, accompanied with Plans, in many instances of several floors—also estimates of Cost—together with General Rules for Building, and Remarks on the Art of Planning a House.

Laying Out Grounds.—Four Articles on Laying out Farms—two on Grounds around Houses and Flower Gardens—eight on Modes of Planting and the Trees and Shrubs to be employed.

What Fruits to Choose.—Sixty-one Varieties of Apples; Fifty-four of Pears; Twenty-eight of Peaches; Ten of Nectarines and Apricots; Thirty-four of Plums; Twenty-eight of Cherries; Thirteen of Strawberries, and a Dozen of Native and Foreign Grapes, are described—with Approved Lists at greater length, and Select Assortments recommended.

Domestic Animals.—Improved Breeds illustrated by Portraits. A valuable article on Doctoring Sick Animals, with Simple Rules and Remedies, embracing the most common Diseases of Horses, Cattle, Sheep and Swine.

Fruit Culture.—Twenty-two Articles—Treatment of Orchards, Large and Small Fruits, with a large number of brief Notes, presenting many valuable Hints and Suggestions.

Farm Buildings.—Barns, Carriage Houses, Stables, the Piggery, Smoke House, Poultry House—Mode of Cistern Building, of Erecting Lightning Rods, &c.

Farm Implements.—Twenty-three Articles, amply illustrated, embracing nearly all the principal Implements in which the Farmer is concerned—also the Wind Mill, Steam Engine, &c.

Butter and Cheese Making.—The best modes and means treated at considerable length, accompanied by Designs for Dairy Houses.

Rural Economy.—Many Articles and Notes, the fruits of the Author's long experience and observation, on Farm Management, Rotation, Packing Trees and Plants, Satisfactory Farming, &c., &c.

Rustic Seats and Structures.—Illustrated Designs for Summer Houses, Flower Stands, Rock Work, and other similar Rural Ornaments.

School Houses.—A Chapter embracing several neat and tasteful Designs.

Weights and Measures.—Tables for Reference, including Length, Distances, Specific Gravities, &c.

Domestic Economy.—Numerous valuable and well tested Recipes for Household use.

VOLUME TWO.

Four Hundred and Fifty Illustrations.

A Complete Country Residence.—The Dwelling, Ornamental Grounds, Orchard, Gardens, Out-Houses, described and illustrated—concluding with an article on the APIARY, embracing the Management of Bees, by M. QUINBY.

Country Houses.—TWENTY-SEVEN DESIGNS, including some of great merit for Workingmen's Cottages, and an illustrated Chapter on Ventilation.

Fruits and Fruit Culture.—Farther Notes and Lists—a full Article on Pear Culture—Hardy Fruits at the West—Apples and Apple Orchards—Grafting and Grafting Knives, with upwards of Fifty Illustrations.

Flower and Kitchen Garden.—Annual Flowers—Vegetable Management—the Vinery and Green-House—the Verbena—also, a full Article on Hedging and HEDGES, with Directions for their Cultivation.

Farm Buildings.—EIGHT DESIGNS of Barns and Stables; Stalls for Horses and Cattle—Cattle and Sheep Racks—also a full Chapter on IRON for Furniture and Rural Structures.

Farm Management.—Mr. THOMAS' Prize Essay, with new Illustrations—also, a Chapter on UNDER-DRAINING, pronounced by all, the most concise and complete of its kind that has yet appeared.

Farm Fences and Gates.—CHEAP FENCES—a full Article on Wire Fences—Modes of Construction—Hurdles—useful Hints about GATES, with Fifteen Engravings on the latter subject alone.

Domestic Animals.—Feeding—Steaming Food—Veterinary Receipts—Wintering and Stabling—Wool Table, &c., &c.

Nursery Lists.—A Descriptive and Illustrated List of the Principal Nurseries in the United States—Supplement to the above—Principal Nurseries in Europe.

Ornamental Planting.—Beautifying Country Houses—Modes of Grouping—Lawns, Walks and Rustic Objects—with NINE PLANS of Grounds and nearly Forty Engravings.

Implements of Tillage.—Tillage—the Gang Plow—Improvements in Plows and Harrows—Plowing and Subsoiling—Ditching Plows—Implements for Surface Tillage.

Other New Implements, &c. — Farm Workshops—A Horse-Power—Hay Fork—Mill—Stalk Cutter—Potato Digger—Painting Tools—with numerous hints.

Rural and Domestic Economy.—Root Crops—Good and Bad Management—Dairy Economy—Rules for Business—Early Melons—Cleaning Seed Wheat—Packing Trees for Transportation, &c.

VOLUME THREE.

Four Hundred and Forty Illustrations.

Working Men's Cottages.—SIX DESIGNS and Seventeen Engravings—the Cottages costing from $250 up to $800.

Grounds and Green-Houses.—The Arrangement of small and large Gardens—Structures for Green-House Plants, including the Cold Pit, Ward Cases, &c.

Farm Buildings.—General Considerations involved in their Construction—FOUR DESIGNS for Barns—Thirty Engravings.

Architecture.—Complete Directions for One, Two or Three Story Buildings, on the BALLOON FRAME System—24 Engravings—Directions as to Carpenter and Mason's Specifications, and a Glossary of Architectural Terms—48 Engravings.

Farm Husbandry.—How to render Farming Profitable, is treated in one or more Chapters, and a very great variety of Hints and Suggestions are given in Practical Matters and General Rural Economy.

Weeds and Grasses.—The chief varieties of Annual and Perennial Weeds, and of Useful Grasses, are described very fully, the former accompanied with 21 Engravings, and the latter with 13.

Practical Entomology.—Doctor FITCH'S Chapter on Insects Injurious to Fruit Trees, Grain Crops and Gardens, with 34 Engravings, and full Definitions and Descriptions.

Fruits and Fruit Culture.—The Newer Plums—Strawberries—Dwarf Pears—Management of the Grape—Summer Pears—Training Pyramids—Dwarf and other Apples—Cherries and Gooseberries—A Cheap Grapery, &c., &c.—more than 50 Engravings.

Flowers.—Pruning and Training Roses—Notes on New and Desirable Flowering Plants—20 Engravings.

Vegetable Physiology.—Tracing Growth of the Plant from the Embryo throughout—the Principles of Grafting and Budding, &c.—61 Engravings.

Domestic Animals.—A large variety of Hints as to Breeds and Management—THE APIARY; different Hives, and the Mode of Caring Properly for Bees.

The Dairy.—A full Chapter on Butter and Cheese Making, and Management of Cows, with numerous Hints.

The Poultry Yard.—A Complete Chapter, by C. N. BEMENT, with 33 Engravings of Fowls, Poultry Houses, &c.

Also—FILTERS and FILTERING CISTERNS, 5 Engravings—LIGHTNING RODS, 13—USEFUL TABLES, of Weights and Measures, &c.—MAPLE SUGAR Making. To these and many other subjects more or less space is devoted.

THE

CULTIVATOR ALMANAC,

FOR 1864.

ASTRONOMICAL CALCULATIONS IN EQUAL OR CLOCK TIME.

ECLIPSES FOR THE YEAR 1864.

THERE will be two eclipses this year, both of the Sun, and neither of them visible in the Atlantic States:

I. A Central Eclipse of the Sun, May 5, in the afternoon. Invisible in the United States east of the Mississippi river, except a mere contact of limbs just at sunset in Wisconsin and the western part of Illinois, in which regions, and in all the States west of that river, except Louisiana, it will be visible as a small PARTIAL Eclipse just at or near sunset. In California and Oregon the Eclipse will be quite large, being in San Francisco about 9 digits in size, and at Portland 7 digits; beginning at San Francisco at 4h. 28m., and ending at 6h. 49m.

II. An Annular Eclipse of the Sun, October 30. Invisible in the United States, except a mere contact of limbs in New Mexico and Texas. It will be visible all over Mexico, the West Indies, and in South America.

THE CYCLES.

The year 1864 is Bissextile or Leap Year, and the latter part of the 88th and beginning (July 4) of the 89th year of American Independence; the 6,577th of the Julian Period; the 7,372-3d of the Byzantine era; the 5,624-5th of the Jewish era; the 2,617th of Rome; the 2,611th of the era of Nabonassar; the 2,640th of the Olympiads; the 2,176th of the Grecian era of the Seleucidæ; the 1,580th of the Diocletian; the 1,281st of the Mohammedan era, which begins on the 6th of June. Dominical Letters, C B; Epact, 22; Golden Number, 3; Solar Cycle, 25; Roman Indiction, 7. The year 5625 of the Jews begins October 1, 1864.

DURATION OF THE SEASONS, ETC.

	D.	H.	M.		D.	H.	M.
Sun in Winter Signs, . . .	89	1	4	Tropical Year, ...	365	5	57
Sun in Spring Signs, . . .	92	20	42	Sun North of Equator, .	186	11	6
Sun in Summer Signs, . .	93	14	24	Sun South of Equator, .	178	18	51
Sun in Autumnal Signs, .	89	17	47	Difference, ...	7	16	15

PHASES OF MERCURY.

At Greatest Elongation.—This Planet exhibits all the lunar phases, and on the 18th of February this year, the 17th of June, and the 24th of October, it will be at its greatest elongation west; and on the 9th of January, the 30th of April, the 20th of August, and the 22d of December, it will be at its greatest elongation east; being a Morning Star at the first named dates, and Evening Star at the others. It will be brightest and slightly gibbous and visible three days after the western elongation, and three days before its eastern elongation. When within and on this side of its points of greatest elongation, it presents to the earth a crescent form.

Mercury will be brightest and visible three days before its greatest elongation east, on the 6th of April, 27th of April, 25th of August, and 19th of December, being then in the west soon after sunset. It will be visible also in the east just before sunrise, three days after its greatest elongation west, on the 21st of February, 20th of June, and 12th of October.

MORNING AND EVENING STARS.

Venus will be Morning Star until July 18, then Evening Star the rest of the year.

Mars will be Morning Star until August 18, then Evening Star the rest of the year.

Jupiter will be Morning Star until February 15, then Evening Star until November 30, then Morning Star the rest of the year.

Saturn will be Morning Star until January 8, then Evening Star until October 13, then Morning Star the rest of the year.

EQUINOXES AND SOLSTICES.

		D.	H.	M.	
Vernal Equinox, ...	March	20,	3	2	morning.
Summer Solstice, ...	June	20,	11	44	evening.
Autumnal Equinox, ...	September	22,	2	8	evening.
Winter Solstice, ...	December	21,	7	55	morning.

THE ASTEROIDS.

There are now at least seventy-six of the little anomalous worlds, which have been discovered between the orbits of Mars and Jupiter.

Note.—The Sun's declination, in the tables for each month, marks the instant his centre is on the meridian of Washington.

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
THIRD QUARTER, ...	2	2 55 m	2 43 m	2 31 m	1	12 3 44
NEW MOON, ...	9	3 1 m	2 49 m	2 37 m	9	12 7 19
FIRST QUARTER, ...	15	6 22 e	6 10 e	5 58 e	17	12 10 20
FULL MOON, ...	23	5 18 e	5 6 e	4 54 e	25	12 12 35
THIRD QUARTER, ...	31	7 33 e	7 21 e	7 9 e		

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. S. ° ′ ″	CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon. SUN rises H M	SUN sets. H M	MOON rises. H M	H. W. Bost. H M	CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio, Indiana and Illinois. SUN rises H M	SUN sets. H M	MOON rises. H M	H. W. N. Y. H M	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. SUN rises H M	SUN sets H M	MOON rises. H M
1	F	23 1 49	7 30	4 38	morn.	3 22	7 25	4 43	morn.	1 8	7 19	4 49	morn.
2	S	22 56 42	7 30	4 39	0 12	5 10	7 25	4 44	0 10	1 56	7 19	4 50	0 9
3	C	22 51 8	7 30	4 40	1 14	6 7	7 25	4 45	1 11	2 53	7 19	4 51	1 9
4	M	22 45 7	7 30	4 41	2 19	7 4	7 25	4 46	2 16	3 50	7 19	4 52	2 12
5	T	22 38 39	7 30	4 41	3 25	8 8	7 25	4 46	3 21	4 54	7 19	4 52	3 16
6	W	22 31 43	7 30	4 42	4 32	9 13	7 25	4 47	4 27	5 59	7 19	4 53	4 22
7	T	22 24 21	7 30	4 43	5 33	10 13	7 25	4 48	5 29	6 59	7 19	4 54	5 24
8	F	22 16 32	7 30	4 44	sets	11 6	7 25	4 49	sets.	7 52	7 19	4 55	sets.
9	S	22 8 18	7 30	4 45	5 41	morn	7 25	4 50	5 45	8 47	7 19	4 56	5 48
10	C	21 59 37	7 29	4 46	6 48	0 1	7 24	4 51	6 51	9 38	7 19	4 57	6 53
11	M	21 50 30	7 29	4 47	8 14	0 52	7 24	4 52	8 15	10 25	7 18	4 58	8 17
12	T	21 40 58	7 29	4 48	9 27	1 39	7 24	4 53	9 27	11 12	7 18	4 59	9 27
13	W	21 31 1	7 28	4 49	10 38	2 26	7 23	4 54	10 37	morn	7 18	5 0	10 36
14	T	21 20 39	7 28	4 50	11 47	3 16	7 23	4 55	11 45	0 2	7 17	5 1	11 43
15	F	21 9 53	7 27	4 52	morn	4 8	7 22	4 57	morn	0 54	7 17	5 2	morn.
16	S	20 58 42	7 27	4 53	0 52	5 3	7 22	4 58	0 49	1 49	7 16	5 3	0 46
17	C	20 47 7	7 26	4 54	1 57	6 0	7 21	4 59	1 53	2 46	7 16	5 4	1 49
18	M	20 35 9	7 25	4 56	2 57	7 1	7 20	5 1	2 53	3 47	7 16	5 6	2 48
19	T	20 22 47	7 25	4 57	3 54	8 0	7 20	5 2	3 49	4 46	7 15	5 7	3 44
20	W	20 10 2	7 24	4 58	4 46	8 58	7 19	5 3	4 41	5 44	7 14	5 8	4 27
21	T	19 56 55	7 23	4 59	5 33	9 50	7 18	5 4	5 28	6 36	7 14	5 9	5 23
22	F	19 43 25	7 22	5 1	6 14	10 35	7 18	5 5	6 10	7 21	7 13	5 10	6 6
23	S	19 29 34	7 22	5 2	rises	11 15	7 17	5 6	rises.	8 1	7 12	5 11	rises.
24	C	19 15 21	7 21	5 3	6 11	11 53	7 16	5 7	6 13	8 39	7 12	5 12	6 16
25	M	19 0 46	7 20	5 4	7 8	ev. 34	7 16	5 8	7 9	9 20	7 11	5 13	7 11
26	T	18 45 51	7 19	5 5	8 5	1 9	7 15	5 9	8 5	9 55	7 10	5 14	8 6
27	W	18 30 35	7 19	5 7	9 3	1 43	7 14	5 11	9 3	10 29	7 9	5 15	9 3
28	T	18 14 59	7 18	5 8	10 2	2 19	7 13	5 12	10 1	11 5	7 9	5 16	10 0
29	F	17 59 3	7 17	5 9	11 1	3 0	7 13	5 13	10 59	11 46	7 8	5 17	10 57
30	S	17 42 46	7 16	5 11	morn	3 44	7 12	5 15	12 2	ev. 30	7 7	5 19	11 57
31	C	17 26 14	7 15	5 12	0 3	4 35	7 11	5 16	morn.	1 21	7 7	5 20	morn.

ASTRONOMY is the science which treats of the heavenly bodies, in their relations to each other and to the earth. The earth is nearly spherical, being about 7,926 miles in diameter at the equator, and 7,899 from pole to pole. It rotates upon its shortest diameter, with a perfectly uniform motion, once in 23h. 56m. 4s., making what is called a sidereal day. At the same time, it revolves about the sun with nearly uniform motion, occupying in its revolution 365d. 5h. 46m. 47.8s. It presents the same side to the sun, on an average, once in 24h., an hour being simply the 24th part of the average solar day. The rotation of the earth upon its axis causes all the heavenly bodies to appear to rise in the east and set in the west, that is, to rotate about the points in the sky toward

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
New Moon,	7	1 26 e	1 14 e	1 2 e	1	12 13 51
First Quarter,	14	8 40 m	8 28 m	8 16 m	9	12 14 30
Full Moon,	22	0 17 e	0 5 e	11 53 m	17	12 14 19
					25	12 13 21

Day of Month.	Day of Week.	Sun's declens. S.	CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			SUN rises	SUN sets.	MOON rises.	H. W. Bost.	SUN rises	SUN sets.	MOON rises.	H. W. N. Y.	SUN rises	SUN sets.	MOON rises.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	M	17 9 22	7 14	5 14	1 7	5 32	7 10	5 18	1 4	2 18	7 6	5 22	1 0
2	T	16 52 11	7 12	5 15	2 10	6 35	7 9	5 19	2 6	3 21	7 5	5 23	2 2
3	W	16 34 43	7 11	5 17	3 5	7 45	7 8	5 20	3 0	4 31	7 4	5 24	2 55
4	T	16 16 57	7 10	5 18	4 4	8 53	7 7	5 21	3 59	5 39	7 3	5 25	3 54
5	F	15 58 54	7 9	5 19	5 7	9 56	7 6	5 22	5 3	6 42	7 2	5 26	4 58
6	S	15 40 35	7 8	5 21	5 55	10 52	7 5	5 24	5 51	7 38	7 1	5 27	5 48
7	C	15 22 0	7 7	5 22	sets	11 40	7 4	5 25	sets	8 26	7 0	5 28	sets.
8	M	15 3 9	7 6	5 24	7 1	morn	7 3	5 26	7 2	9 18	6 59	5 29	7 3
9	T	14 44 3	7 5	5 25	8 15	0 32	7 2	5 28	8 15	10 3	6 58	5 30	8 15
10	W	14 24 42	7 3	5 26	9 27	1 17	7 0	5 29	9 26	10 44	6 57	5 31	9 24
11	T	14 5 7	7 2	5 27	10 36	1 58	6 59	5 30	10 34	11 34	6 56	5 32	10 31
12	F	13 45 18	7 1	5 29	11 44	2 48	6 58	5 32	11 41	morn	6 55	5 34	11 38
13	S	13 25 16	7 0	5 30	morn.	3 40	6 56	5 33	morn.	0 26	6 54	5 35	morn.
14	C	13 5 1	6 58	5 31	0 48	4 36	6 55	5 34	0 44	1 22	6 53	5 36	0 40
15	M	12 44 33	6 57	5 32	1 48	5 33	6 54	5 35	1 43	2 19	6 51	5 37	1 39
16	T	12 23 53	6 55	5 33	2 42	6 33	6 53	5 36	2 37	3 19	6 50	5 38	2 32
17	W	12 3 1	6 54	5 34	3 31	7 35	6 51	5 37	3 26	4 21	6 49	5 39	3 21
18	T	11 41 58	6 52	5 36	4 13	8 30	6 50	5 38	4 9	5 16	6 48	5 40	4 4
19	F	11 20 44	6 51	5 37	4 50	9 21	6 49	5 39	4 47	6 7	6 47	5 41	4 43
20	S	10 59 19	6 49	5 39	5 24	10 7	6 47	5 41	5 21	6 53	6 45	5 42	5 19
21	C	10 37 45	6 48	5 40	5 55	10 48	6 46	5 42	5 53	7 34	6 44	5 43	5 51
22	M	10 16 0	6 47	5 41	rises	11 22	6 44	5 43	rises	8 8	6 43	5 44	rises.
23	T	9 54 6	6 45	5 43	6 57	12 0	6 43	5 45	6 57	8 46	6 42	5 46	6 57
24	W	9 32 2	6 43	5 44	7 56	ev. 38	6 41	5 46	7 55	9 24	6 40	5 47	7 54
25	T	9 9 51	6 42	5 45	8 55	1 13	6 39	5 47	8 53	9 59	6 39	5 48	8 51
26	F	8 47 31	6 41	5 46	9 56	1 51	6 38	5 48	9 53	10 37	6 38	5 49	9 51
27	S	8 25 3	6 39	5 47	10 58	2 31	6 37	5 49	10 54	11 17	6 36	5 50	10 51
28	C	8 2 27	6 37	5 48	morn	3 17	6 36	5 49	11 57	ev. 3	6 34	5 51	11 53
29	M	7 39 45	6 36	5 49	0 1	4 10	6 35	5 50	morn	0 56	6 33	5 52	morn.

which the axis of the earth is directed; in other words, the points which would be directly overhead at the poles. The axis of the earth always points to nearly the same spot among the stars, showing that it remains nearly parallel to itself. But as it is not perpendicular to the path in which the earth is moving round the sun, this fixedness of direction in the axis causes our globe to present itself to the sun in its daily rotation, differently at different seasons of the year, turning the two poles alternately more nearly toward the sun. This causes the sun to appear to us to rise further north in summer, further south in winter, but his course from sunrise to sunset on any one day, is very nearly parallel to his course on any other day. Hence, when he rises further north he remains longer above the horizon, and shines down more nearly perpendicularly at noon, two effective causes of the warmth of summer. The stars move over, from rising to setting, somewhat faster than the sun, that is to say, the revolution of the earth about

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
Third Quarter,	1	8 28 m	8 16 m	8 4 m	1	12 12 26
New Moon,	7	11 15 e	11 3 e	10 51 e	9	12 10 34
First Quarter,	15	1 23 m	1 11 m	0 59 m	17	12 8 20
Full Moon,	23	5 40 m	5 28 m	5 16 m	25	12 5 54
Third Quarter,	30	5 36 e	5 24 e	5 12 e		

CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon. — CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'a, Ohio, Indiana and Illinois. — CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.

Day of Month.	Day of Week.	Sun's declens. S. ° ′ ″	Sun rises (Boston) H M	Sun sets (Boston) H M	Moon rises (Boston) H M	H. W. Bost. H M	Sun rises (N.Y.) H M	Sun sets (N.Y.) H M	Moon rises (N.Y.) H M	H. W. N. Y. H M	Sun rises (Wash.) H M	Sun sets (Wash.) H M	Moon rises (Wash.) H M
1	T	7 16 55	6 35	5 50	1 2	5 10	6 35	5 50	0 57	1 56	6 33	5 52	0 53
2	W	6 54 0	6 33	5 51	2 0	6 17	6 33	5 51	1 55	3 3	6 31	5 53	1 40
3	T	6 30 58	6 32	5 53	2 54	7 28	6 32	5 53	2 50	4 14	6 30	5 54	2 45
4	F	6 7 52	6 30	5 54	3 43	8 35	6 30	5 54	3 40	5 21	6 29	5 55	3 35
5	S	5 44 40	6 29	5 55	4 28	9 36	6 29	5 55	4 25	6 22	6 27	5 56	4 22
6	B	5 21 23	6 27	5 56	5 6	10 30	6 27	5 56	5 4	7 16	6 26	5 57	5 2
7	M	4 58 2	6 26	5 58	sets	11 16	6 26	5 58	sets.	8 2	6 25	5 58	sets.
8	T	4 34 37	6 24	5 59	7 0	morn	6 24	5 59	7 0	8 52	6 24	5 59	6 59
9	W	4 11 9	6 23	6 0	8 14	0 6	6 23	6 0	8 12	9 38	6 22	6 0	8 10
10	T	3 47 38	6 21	6 1	9 23	0 52	6 21	6 1	9 20	10 22	6 20	6 1	9 17
11	F	3 24 4	6 19	6 2	10 32	1 36	6 19	6 2	10 28	11 8	6 18	6 2	10 24
12	S	3 0 28	6 17	6 3	11 34	2 22	6 17	6 3	11 30	12 0	6 17	6 3	11 25
13	B	2 36 50	6 15	6 5	morn	3 14	6 15	6 4	morn	morn	6 15	6 4	morn.
14	M	2 23 11	6 14	6 6	0 32	4 7	6 14	6 5	0 28	0 53	6 14	6 5	0 23
15	T	1 49 30	6 12	6 7	1 24	5 5	6 12	6 6	1 20	1 51	6 13	6 6	1 15
16	W	1 25 49	6 10	6 8	2 10	6 3	6 10	6 7	2 5	2 49	6 11	6 7	2 1
17	T	1 2 7	6 9	6 9	2 49	7 1	6 9	6 8	2 46	3 47	6 10	6 8	2 41
18	F	0 38 25	6 7	6 10	3 25	7 54	6 7	6 9	3 22	4 40	6 8	6 9	3 18
19	S	0 14 43	6 5	6 11	3 57	8 46	6 5	6 10	3 54	5 32	6 6	6 10	3 52
20	B	N. 8 58	6 3	6 13	4 25	9 32	6 3	6 12	4 24	6 18	6 5	6 11	4 22
21	M	0 32 38	6 2	6 14	4 53	10 14	6 2	6 13	4 52	7 0	6 3	6 12	4 51
22	T	0 56 16	6 0	6 15	rises	10 52	6 0	6 14	rises.	7 38	6 2	6 13	rises.
23	W	1 19 53	5 59	6 17	6 48	11 26	5 59	6 15	6 47	8 12	6 1	6 14	6 45
24	T	1 43 29	5 57	6 18	7 49	ev. 7	5 58	6 16	7 46	8 53	5 59	6 15	7 44
25	F	2 7 1	5 55	6 19	8 52	0 46	5 56	6 17	8 49	9 32	5 57	6 16	8 45
26	S	2 30 31	5 53	6 20	9 54	1 27	5 55	6 18	9 51	10 13	5 56	6 17	9 46
27	B	2 53 59	5 52	6 21	10 56	2 9	5 54	6 19	10 51	10 55	5 54	6 18	10 47
28	M	3 17 22	5 51	6 22	11 54	2 59	5 52	6 20	11 50	11 45	5 53	6 19	11 45
29	T	3 40 42	5 49	6 23	morn	3 54	5 51	6 21	morn	ev. 40	5 52	6 20	morn.
30	W	4 3 59	5 47	6 24	0 49	4 56	5 49	6 22	0 44	1 42	5 50	6 21	0 39
31	T	4 27 10	5 45	6 25	1 37	6 3	5 47	6 23	1 33	2 49	5 48	6 22	1 29

the sun causes the sun to appear to move round among the stars, and his apparent path among the stars is called the ecliptic. The circle in the heavens, midway between the poles, that is, between the points overhead at the earth's poles, is called the celestial equator. The equator crosses the ecliptic at an angle (about 23 deg. 27 m. 36 s.) which is called the obliquity of the ecliptic. This angle produces seasons exactly adapted to existing plants and animals. Were it materially greater or less, the whole organic life on the planet would need to be different. The times when the sun apparently crosses the celestial equator, in March and September, are called the equinoxes, because at that time the day is equal to the night over the whole globe. The times when he arrives,

4th MONTH. **APRIL, 1864.** **30 DAYS.**

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
NEW MOON,	6	9 5 m	8 53 m	8 41 m	1	12 3 45
FIRST QUARTER,	13	7 27 e	7 12 e	7 0 e	9	12 1 26
FULL MOON,	21	8 35 e	8 23 e	8 11 e	17	11 59 24
THIRD QUARTER,	28	11 50 e	11 38 e	11 26 e	25	11 57 46

DAY OF MONTH.	DAY OF WEEK.	Sun's declen. N. ° ′ ″	CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon. SUN rises H M	SUN sets. H M	MOON rises. H M	H. W. Bost. H M	CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio Indiana and Illinois. SUN rises H M	SUN sets. H M	MOON rises. H M	H. W. N. Y. H M	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. SUN rises H M	SUN sets. H M	MOON rises. H M
1	F	4 50 17	5 43	6 26	2 21	7 7	5 45	6 24	2 17	3 53	5 46	6 22	2 14
2	S	5 13 19	5 41	6 27	3 1	8 13	5 42	6 25	2 59	4 59	5 44	6 23	2 56
3	B	5 36 15	5 40	6 28	3 36	9 13	5 41	6 26	3 35	5 59	5 43	6 24	3 33
4	M	5 59 6	5 38	6 29	4 11	10 7	5 39	6 27	4 11	6 53	5 41	6 25	4 11
5	T	6 21 50	5 36	6 30	4 44	10 56	5 37	6 28	4 45	7 42	5 39	6 25	4 46
6	W	6 44 28	5 34	6 31	sets	11 39	5 35	6 29	sets.	8 25	5 38	6 26	sets.
7	T	7 6 59	5 32	6 32	8 8	morn	5 33	6 30	8 5	9 14	5 37	6 27	8 2
8	F	7 29 22	5 30	6 33	9 16	0 28	5 31	6 31	9 12	10 0	5 36	6 28	9 8
9	S	7 51 38	5 29	6 34	10 17	1 14	5 30	6 32	10 12	10 46	5 33	6 29	10 8
10	B	8 13 47	5 27	6 35	11 12	2 [illegible]	5 28	6 33	11 8	11 33	5 31	6 30	11 3
11	M	8 35 46	5 25	6 36	morn.	2 47	5 26	6 34	11 58	morn.	5 29	6 31	11 53
12	T	8 57 37	5 24	6 37	0 2	3 39	5 25	6 35	morn.	0 25	5 28	6 32	morn.
13	W	9 19 19	5 22	6 38	0 45	4 33	5 24	6 36	0 41	1 19	5 27	6 33	0 37
14	T	9 40 52	5 21	6 39	1 24	5 15	5 22	6 37	1 20	2 11	5 25	6 34	1 17
15	F	10 2 15	5 19	6 40	1 57	6 21	5 21	6 38	1 54	3 7	5 24	6 35	1 51
16	S	10 23 28	5 17	6 41	2 26	7 13	5 20	6 39	2 24	3 59	5 23	6 36	2 22
17	B	10 44 31	5 16	6 42	2 54	8 2	5 18	6 40	2 53	4 48	5 21	6 37	2 52
18	M	11 5 23	5 15	6 43	3 21	8 50	5 16	6 41	3 21	5 36	5 20	6 38	3 21
19	T	11 26 04	5 13	6 44	3 49	9 36	5 15	6 42	3 49	6 2[illegible]	5 19	6 39	3 50
20	W	11 46 34	5 12	6 46	4 15	10 18	5 13	6 44	4 17	7 4	5 17	6 40	4 18
21	T	12 6 53	5 10	6 47	rises	10 58	5 11	6 45	rises	7 44	5 15	6 41	rises,
22	F	12 26 59	5 8	6 48	7 46	11 35	5 10	6 46	7 42	8 24	5 14	6 42	7 38
23	S	12 46 54	5 6	6 49	8 48	ev. 24	5 9	6 47	8 44	9 10	5 13	6 43	8 39
24	B	13 6 36	5 4	6 51	9 48	1 10	5 7	6 48	9 43	9 56	5 11	6 44	9 39
25	M	13 26 5	5 3	6 52	10 45	1 54	5 6	6 49	10 40	10 40	5 10	6 45	10 35
26	T	13 45 20	5 2	6 53	11 35	2 46	5 5	6 50	11 31	11 32	5 9	6 46	11 27
27	W	14 4 23	5 1	6 54	morn	3 42	5 3	6 51	morn.	ev. 28	5 7	6 47	morn.
28	T	14 23 11	4 59	6 56	0 20	4 42	5 2	6 52	0 16	1 28	5 6	6 48	0 13
29	F	14 41 46	4 57	6 57	1 1	5 45	5 1	6 53	0 59	2 31	5 4	6 49	0 56
30	S	15 0 6	4 56	6 58	1 37	6 48	5 0	6 54	1 35	3 34	5 3	6 50	1 33

in June and December, at his most northern and southern limits, are called solstices, because the sun (Sol) appears to stand for a few days, that is, not to go north or south. The earth's orbit is an ellipse, with the sun in one focus, so that we are about three millions of miles nearer to him at our perihelion, in the northern winter, than at our aphelion—our average distance being about 95 millions of miles. The sun's diameter is about 111 times that of the earth, so that he is 1,400,000 times as large as the earth, though his weight is only 350,000 times that of our planet. The moon bears somewhat the same relation to the earth that the earrh does to the sun. She moves about us in an ellipse, her average distance being 238,650 miles. Her diameter is 2,160 miles. Her eclipses take place at full moon, because it is only then that she can ever pass through the shadow of the earth. She produces eclipses of the sun at new moon, because it is only then

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
NEW MOON,	5	7 30 e	7 18 e	7 6 e	1	11 56 53
FIRST QUARTER,	13	1 36 e	1 24 e	1 12 e	9	11 56 14
FULL MOON,	21	8 40 m	8 28 m	8 16 m	17	11 56 11
THIRD QUARTER,	28	4 37 m	4 25 m	4 13 m	25	11 56 43

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.	CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon. SUN rises	SUN sets.	MOON rises.	H. W. Bost.	CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio, Indiana and Illinois. SUN rises	SUN sets.	MOON rises.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. SUN rises	SUN sets	MOON rises.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	B	15 18 11	4 54	6 59	2 10	7 49	4 59	6 55	2 9	4 35	5 2	6 52	2 8
2	M	15 36 1	4 53	7 0	2 43	8 48	4 58	6 56	2 43	5 34	5 1	6 53	2 43
3	T	15 53 36	4 51	7 1	3 16	9 43	4 57	6 57	3 18	6 29	5 0	6 54	3 19
4	W	16 10 55	4 50	7 2	3 52	10 33	4 56	6 58	3 54	7 19	4 59	6 55	3 56
5	T	16 27 58	4 49	7 3	sets.	11 18	4 55	6 59	sets.	8 4	4 58	6 56	sets.
6	F	16 44 45	4 48	7 4	8 0	morn	4 54	7 0	7 55	8 52	4 57	6 56	7 51
7	S	17 1 15	4 47	7 5	9 0	0 6	4 53	7 1	8 55	9 39	4 56	6 57	8 51
8	B	17 17 27	4 46	7 6	9 53	0 53	4 52	7 2	9 48	10 24	4 55	6 58	9 44
9	M	17 33 23	4 45	7 7	10 39	1 38	4 51	7 3	10 35	11 6	4 54	6 59	10 30
10	T	17 49 1	4 44	7 8	11 19	2 20	4 50	7 4	11 16	11 54	4 53	7 0	11 12
11	W	18 4 21	4 43	7 9	11 55	3 8	4 49	7 5	11 52	morn.	4 52	7 1	11 49
12	T	18 19 23	4 42	7 10	morn	3 56	4 48	7 6	morn	0 42	4 51	7 2	morn.
13	F	18 34 6	4 41	7 11	0 26	4 44	4 47	7 7	0 24	1 32	4 50	7 3	0 22
14	S	18 48 31	4 40	7 12	0 56	5 33	4 45	7 8	0 54	2 19	4 49	7 4	0 53
15	B	19 2 36	4 39	7 13	1 22	6 24	4 44	7 9	1 21	3 1[illegible]	4 48	7 5	1 20
16	M	19 16 23	4 38	7 14	1 49	7 15	4 43	7 10	1 49	4 1	4 47	7 6	1 49
17	T	19 29 49	4 37	7 15	2 16	8 5	4 42	7 11	2 17	4 51	4 46	7 7	2 18
18	W	19 42 56	4 36	7 16	2 45	8 56	4 41	7 12	2 48	5 42	4 45	7 7	2 50
19	T	19 55 43	4 35	7 17	3 17	9 44	4 40	7 13	3 20	6 30	4 44	7 8	3 23
20	F	20 8 9	4 35	7 18	3 54	10 31	4 39	7 14	3 58	7 17	4 44	7 9	4 2
21	S	20 20 15	4 34	7 19	rises	11 17	4 38	7 15	rises.	8 3	4 43	7 10	rises.
22	B	20 32 0	4 33	7 20	8 36	ev. 6	4 37	7 16	8 31	8 5	4 42	7 10	8 27
23	M	20 43 24	4 32	7 21	9 32	0 56	4 36	7 17	9 27	9 42	4 42	7 11	9 23
24	T	20 54 27	4 31	7 22	10 19	1 44	4 35	7 18	10 16	10 30	4 41	7 12	10 12
25	W	21 5 8	4 30	7 23	11 2	2 33	4 35	7 19	10 59	11 19	4 40	7 13	10 57
26	T	21 15 27	4 29	7 24	11 39	3 29	4 34	7 20	11 37	ev 15	4 40	7 14	11 35
27	F	21 25 25	4 28	7 25	morn	4 24	4 33	7 21	morn	1 10	4 39	7 14	morn.
28	S	21 35 0	4 28	7 26	0 13	5 22	4 33	7 22	0 12	2 8	4 38	7 15	0 11
29	B	21 44 13	4 27	7 27	0 45	6 23	4 32	7 23	0 45	3 9	4 38	7 16	0 45
30	M	21 53 3	4 26	7 28	1 18	7 24	4 31	7 24	1 19	4 10	4 37	7 16	1 20
31	T	21 1 31	4 26	7 28	1 51	8 23	4 31	7 25	1 53	5 9	4 37	7 17	1 55

that her shadow can fall upon us. Her attraction causes the phenomenon of the tides, which are, however, greatly modified by other circumstances. The moon is held in her orbit simply by her weight, that is, the attraction of the earth, and the earth is held in its orbit simply by its weight, the attraction of the sun. No other appreciable force is known to influence the motion of these bodies. Bodies bearing a relation to the sun similar to that of the earth are called planets; those holding a position similar to that of the moon are called satellites. The planets known to the ancients were Mercury, Venus, Mars, Jupiter and Saturn. To these the moderns have added Uranus, the asteroids and Neptune. Mercury's distance from the sun varies, in different parts of his orbit, from 29 to 44 millions of miles. He is occasionally seen, just after sunset, in the

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
New Moon,	4	6 56 m	6 44 m	6 32 m	1	11 57 37
First Quarter,	12	7 4 m	6 52 m	6 40 m	9	11 59 2
Full Moon,	19	6 10 e	5 58 e	5 46 e	17	12 0 41
Third Quarter,	26	9 31 m	9 19 m	9 7 m	25	12 2 24

Day of Month.	Day of Week.	Sun's declens. N.	CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			Sun rises	Sun sets.	Moon rises.	H. W. Bost.	Sun rises	Sun sets.	Moon rises.	H. W. N. Y.	Sun rises	Sun sets.	Moon rises.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	W	22 9 35	4 25	7 29	2 27	9 20	4 31	7 24	2 29	6 6	4 36	7 18	2 32
2	T	22 17 17	4 24	7 30	3 8	10 13	4 30	7 25	3 11	6 59	4 36	7 19	3 15
3	F	22 24 35	4 24	7 30	3 51	10 58	4 30	7 25	3 55	7 44	4 35	7 19	4 0
4	S	22 31 29	4 23	7 31	sets	11 44	4 29	7 26	sets.	8 30	4 35	7 20	sets.
5	B	22 38 0	4 23	7 32	8 33	morn	4 29	7 27	8 29	9 19	4 35	7 20	8 24
6	M	22 44 8	4 23	7 33	9 16	0 33	4 28	7 27	9 12	10 0	4 34	7 21	9 8
7	T	22 49 51	4 22	7 33	9 54	1 14	4 28	7 28	9 50	10 40	4 34	7 21	9 47
8	W	22 55 10	4 22	7 34	10 26	1 51	4 28	7 28	10 24	11 20	4 34	7 22	10 21
9	T	23 0 5	4 22	7 35	10 56	2 34	4 28	7 29	10 54	morn	4 34	7 22	10 52
10	F	23 4 36	4 22	7 35	11 23	3 18	4 28	7 29	11 22	0 4	4 34	7 23	11 21
11	S	23 8 43	4 22	7 36	11 51	4 1	4 28	7 30	11 51	0 47	4 34	7 24	11 50
12	B	23 12 25	4 22	7 37	morn	4 46	4 28	7 30	morn.	1 32	4 34	7 25	morn.
13	M	23 15 42	4 22	7 37	0 16	5 34	4 28	7 31	0 17	2 20	4 34	7 25	0 18
14	T	23 18 35	4 22	7 38	0 44	6 26	4 28	7 31	0 46	3 12	4 34	7 26	0 48
15	W	23 21 4	4 22	7 38	1 15	7 20	4 28	7 32	1 17	4 6	4 33	7 27	1 20
16	T	23 23 7	4 22	7 38	1 27	8 15	4 28	7 32	1 32	5 1	4 33	7 27	1 37
17	F	23 24 46	4 22	7 39	2 29	9 11	4 28	7 33	2 33	5 57	4 33	7 28	2 37
18	S	23 26 1	4 22	7 39	3 17	10 8	4 28	7 33	3 21	6 54	4 33	7 28	3 26
19	B	23 26 50	4 23	7 39	rises	11 0	4 29	7 34	rises	7 46	4 33	7 28	rises.
20	M	23 27 15	4 23	7 39	8 16	11 50	4 29	7 34	8 11	8 36	4 34	7 28	8 7
21	T	23 27 14	4 23	7 39	8 59	ev. 4	4 29	7 34	8 55	9 28	4 34	7 28	8 52
22	W	23 26 49	4 23	7 40	9 40	1 31	4 29	7 34	9 37	10 17	4 34	7 29	9 35
23	T	23 25 59	4 23	7 40	10 15	2 18	4 29	7 35	10 14	11 4	4 34	7 29	10 12
24	F	23 24 45	4 24	7 40	10 48	3 10	4 30	7 35	10 48	11 56	4 35	7 29	10 48
25	S	23 23 5	4 24	7 40	11 21	4 3	4 30	7 35	11 22	ev. 49	4 35	7 29	11 22
26	B	23 21 1	4 24	7 40	11 53	4 59	4 30	7 35	11 55	1 45	4 35	7 29	11 57
27	M	23 18 32	4 25	7 40	morn.	5 56	4 30	7 35	morn.	2 42	4 35	7 29	morn.
28	T	23 15 39	4 25	7 40	0 29	6 59	4 31	7 35	0 31	3 45	4 36	7 29	0 34
29	W	23 12 21	4 25	7 40	1 6	7 59	4 31	7 35	1 10	4 45	4 36	7 29	1 23
30	T	23 8 39	4 25	7 40	1 48	8 59	4 31	7 35	1 52	5 45	4 36	7 29	1 56

west. The distance of Venus from the sun is about 69 millions of miles. She is the brightest of the planets. Mars is, in perihelion, about 133 millions, in aphelion 159 millions of miles from the sun. The group of the asteroids lie scattered between 200 and 300 millions of miles from the sun. Jupiter, whose diameter is more than 11 times that of the earth, is about 496 millions of miles from the sun, and is attended by four moons, whose eclipses have been of great value in determining longitudes at sea, and have rendered to physics the memorable service of betraying the motion and velocity of light. These eclipses appear to take place 16 m. 27 s. later when the sun is on the opposite side of the sun from Jupiter; the light being then obliged to cross the orbit of the earth, and thus travel 190 millions of miles further before reaching us, than it does when we are in the part of our orbit nearest to Jupiter. The planet Saturn, at the distance of 909

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H	M	S
New Moon,	3	7 39 e	7 27 e	7 15 e	1	12	3	36
First Quarter,	11	11 7 e	10 55 e	10 43 e	9	12	4	58
Full Moon,	19	1 52 m	1 40 m	1 28 m	17	12	5	52
Third Quarter,	25	4 2 e	3 50 e	3 38 e	25	12	6	12

Day of Month.	Day of Week.	Sun's declens. N. ° ′ ″	CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon. Sun rises H M	Sun sets. H M	Moon rises. H M	H. W. Bost. H M	CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio, Indiana and Illinois. Sun rises H M	Sun sets. H M	Moon rises. H M	H. W. N. Y. H M	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. Sun rises H M	Sun sets H M	Moon rises. H M
1	F	23 4 33	4 26	7 40	3 34	9 54	4 31	7 35	2 39	6 40	4 37	7 29	2 44
2	S	23 0 2	4 26	7 40	3 25	10 42	4 32	7 35	3 30	7 28	4 37	7 29	3 34
3	B	22 55 7	4 27	7 40	sets.	11 24	4 32	7 35	sets.	8 10	4 38	7 29	sets.
4	M	22 49 48	4 27	7 39	7 52	morn.	4 33	7 34	7 48	8 54	4 38	7 28	7 44
5	T	22 44 6	4 28	7 39	8 27	0 8	4 33	7 34	8 24	9 33	4 39	7 28	8 21
6	W	22 37 59	4 29	7 39	8 59	0 47	4 34	7 34	8 56	10 14	4 40	7 28	8 54
7	T	22 31 30	4 29	7 39	9 27	1 28	4 34	7 34	9 25	10 46	4 40	7 28	9 24
8	F	22 24 37	4 30	7 38	9 53	2 0	4 35	7 33	9 53	11 25	4 41	7 27	9 52
9	S	22 17 20	4 31	7 38	10 21	2 39	4 36	7 33	10 21	morn	4 42	7 27	10 22
10	B	22 9 41	4 31	7 38	10 48	3 21	4 37	7 33	10 49	0 7	4 42	7 27	10 50
11	M	22 1 39	4 32	7 37	11 15	4 4	4 38	7 32	11 18	0 50	4 43	7 26	11 20
12	T	21 53 14	4 33	7 37	11 48	4 52	4 39	7 32	11 51	1 38	4 44	7 26	11 54
13	W	21 44 27	4 34	7 36	morn	5 45	4 39	7 31	morn.	2 31	4 45	7 25	morn.
14	T	21 35 18	4 35	7 36	0 23	6 42	4 40	7 31	0 26	3 28	4 45	7 25	0 30
15	F	21 25 46	4 36	7 35	1 6	7 43	4 41	7 30	1 10	4 29	4 46	7 24	1 15
16	S	21 15 53	4 37	7 34	1 56	8 47	4 42	7 29	2 1	5 33	4 47	7 24	2 5
17	B	21 5 38	4 38	7 34	2 54	9 48	4 43	7 29	2 59	6 34	4 48	7 23	3 4
18	M	20 55 2	4 39	7 33	rises	10 44	4 43	7 28	rises.	7 30	4 49	7 23	rises.
19	T	20 44 4	4 39	7 32	7 34	11 34	4 44	7 27	7 31	8 19	4 50	7 22	7 28
20	W	20 32 46	4 40	7 32	8 12	ev. 26	4 45	7 27	8 10	9 12	4 50	7 22	8 8
21	T	20 21 6	4 41	7 31	8 48	1 14	4 46	7 26	8 47	10 0	4 51	7 21	8 47
22	F	20 9 6	4 42	7 30	9 23	2 0	4 47	7 25	9 23	10 46	4 52	7 20	9 23
23	S	19 56 46	4 43	7 29	9 58	2 47	4 48	7 24	9 59	11 33	4 53	7 19	10 1
24	B	19 44 6	4 44	7 28	10 31	3 40	4 49	7 23	10 33	ev. 26	4 53	7 18	10 36
25	M	19 31 6	4 45	7 27	11 8	4 35	4 49	7 22	11 11	1 21	4 54	7 17	11 14
26	T	19 17 47	4 46	7 26	11 48	5 31	4 50	7 22	11 52	2 17	4 55	7 16	11 56
27	W	19 4 8	4 47	7 25	morn.	6 36	4 51	7 21	morn	3 22	4 56	7 15	morn.
28	T	18 50 11	4 48	7 24	0 33	7 39	4 52	7 20	0 38	4 25	4 56	7 14	0 42
29	F	18 35 55	4 49	7 23	1 22	8 38	4 53	7 19	1 27	5 24	4 57	7 14	1 31
30	S	18 21 20	4 50	7 22	2 15	9 33	4 54	7 18	2 20	6 19	4 58	7 14	2 24
31	B	18 6 27	4 51	7 21	3 9	10 21	4 55	7 17	3 13	7 7	4 59	7 13	3 18

millions of miles from the sun, is accompanied by a system of rings of fluid matter, held in their position about the planet by 8 satellites. Uranus was discovered by Herschel, in 1781. Its distance from the sun is 1,828 millions of miles, which makes its time of revolution round the sun about 84 years. It is accompanied by 6 satellites. The planet Neptune was first seen in 1846, and one satellite was soon discovered. The existence of Neptune had long been suspected, from the motions of Uranus, which indicated an exterior attraction, and its place and magnitude were calculated by Adams, of Cambridge, England, and by Leverrier, of Paris, before it had been seen. Its distance does not, however, agree with their calculations, as it is but 2,862 instead of 3,500 millions of miles from the sun. This discrepancy does not arise from any error in their calculation,

8th MONTH. # AUGUST, 1864. **31 DAYS.**

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
New Moon, ...	2	9 49 m	9 37 m	9 25 m	1	12 6 0
First Quarter, ...	10	1 13 e	1 1 e	0 49 e	9	12 5 10
Full Moon, ...	17	8 52 m	8 40 m	8 28 m	17	12 3 43
Third Quarter, ...	24	1 20 m	1 8 m	0 56 m	25	12 1 44

					CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.			SUN rises	SUN sets.	MOON rises.	H. W. Bost.	SUN rises	SUN sets.	MOON rises.	H. W. N. Y.	SUN rises	SUN sets	MOON rises.
		°	′	″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	M	17	51	17	4 52	7 20	4 6	11 0	4 56	7 16	4 10	7 46	5 0	7 12	4 23
2	T	17	35	49	4 53	7 19	sets	11 39	4 57	7 15	sets.	8 25	5 1	7 11	sets
3	W	17	20	4	4 54	7 18	7 29	morn	4 58	7 14	7 28	9 4	5 2	7 10	7 26
4	T	17	4	2	4 55	7 16	7 57	0 18	4 59	7 13	7 56	9 41	5 2	7 9	7 56
5	F	16	47	43	4 56	7 15	8 24	0 55	5 0	7 12	8 24	10 16	5 3	7 8	8 25
6	S	16	31	8	4 57	7 14	8 52	1 30	5 1	7 11	8 53	10 50	5 4	7 7	8 52
7	B	16	14	18	4 58	7 13	9 19	2 4	5 2	7 10	9 21	11 29	5 5	7 6	9 22
8	M	15	57	12	4 59	7 11	9 48	2 43	5 3	7 9	9 51	morn	5 6	7 4	9 54
9	T	15	39	50	5 0	7 10	10 22	3 27	5 4	7 8	10 25	0 13	5 7	7 3	10 28
10	W	15	22	13	5 1	7 9	11 0	4 14	5 5	7 6	11 4	1 0	5 8	7 1	11 8
11	T	15	4	22	5 2	7 8	11 46	5 9	5 6	7 5	11 51	1 55	5 9	7 0	11 54
12	F	14	46	17	5 3	7 7	morn	6 10	5 7	7 3	morn.	2 56	5 10	6 59	morn.
13	S	14	27	57	5 4	7 5	0 40	7 18	5 8	7 2	0 44	4 4	5 11	6 58	0 49
14	B	14	9	23	5 5	7 4	1 40	8 24	5 9	7 0	1 44	5 10	5 12	6 57	1 49
15	M	13	50	36	5 6	7 2	2 49	9 28	5 10	6 59	2 52	6 14	5 13	6 55	2 56
16	T	13	31	36	5 7	7 1	4 2	10 26	5 11	6 58	4 5	7 12	5 14	6 54	4 8
17	W	13	12	23	5 8	7 0	rises	11 16	5 12	6 57	rises.	8 2	5 15	6 53	rises.
18	T	12	52	57	5 9	6 58	7 19	ev. 6	5 13	6 55	7 19	8 52	5 16	6 52	7 19
19	F	12	33	19	5 10	6 56	7 55	0 53	5 14	6 54	7 56	9 39	5 17	6 50	7 57
20	S	12	13	29	5 11	6 55	8 31	1 38	5 15	6 53	8 33	10 24	5 18	6 49	8 35
21	B	11	53	28	5 12	6 54	9 8	2 24	5 16	6 51	9 11	11 10	5 19	6 48	9 14
22	M	11	33	14	5 14	6 52	9 49	3 17	5 17	6 50	9 53	ev. 3	5 20	6 46	9 57
23	T	11	12	50	5 15	6 51	10 33	4 12	5 18	6 49	10 37	0 58	5 21	6 45	10 41
24	W	10	52	15	5 16	6 49	11 19	5 11	5 19	6 47	11 24	1 57	5 21	6 43	11 29
25	T	10	31	30	5 17	6 48	morn	6 14	5 20	6 45	morn.	3 0	5 22	6 42	morn.
26	F	10	10	34	5 18	6 46	0 11	7 15	5 21	6 43	0 15	4 1	5 23	6 41	0 20
27	S	9	49	29	5 19	6 44	1 5	8 11	5 22	6 41	1 9	4 57	5 24	6 39	1 14
28	B	9	28	14	5 20	6 42	2 1	9 5	5 23	6 40	2 5	5 51	5 25	6 38	2 9
29	M	9	6	50	5 21	6 41	2 58	9 52	5 24	6 38	3 1	6 38	5 26	6 36	3 4
30	T	8	45	18	5 22	6 39	3 54	10 33	5 25	6 36	3 57	7 19	5 27	6 34	3 59
31	W	8	23	37	5 23	6 37	4 51	11 9	5 26	6 34	4 52	7 55	5 28	6 33	4 54

but from the fact that there were two places in which a planet might have been placed to produce the observed disturbances of Uranus. Leverrier and Adams calculated one place correctly, but it so happened that the planet occupied the other spot. In addition to this train of planets, the sun is attended by a vast host of comets, which move about him at all distances, and in all directions. The comets and planets, however, all agree in these three particulars: they move in ellipses, with the sun in one focus; a line drawn from either of them to the sun would have an angular velocity at the sun, that is, alter its direction in exact proportion to the nearness of the body to the sun; and if the times of revolution of any two bodies round the sun be each multiplied by itself, and the distances of the same bodies from the sun be each multiplied twice by itself, the resulting

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M
New Moon,	1	1 24 m	1 12 m	1 0 m
First Quarter,	9	1 6 m	0 54 m	0 42 m
Full Moon,	15	4 25 e	4 13 e	4 1 e
Third Quarter,	22	2 10 e	1 58 e	1 46 e
New Moon,	30	5 59 e	5 47 e	5 35 e

Sun on Meridian or Noon Mark. D	H M S
1	11 59 39
9	11 57 0
17	11 54 12
25	11 51 25

Day of Month.	Day of Week.	Sun's declens. N. ° ′ ″	CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon. Sun rises H M	Sun sets. H M	Moon sets. H M	H. W. Bost. H M	CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio, Indiana and Illinois. Sun rises H M	Sun sets. H M	Moon sets. H M	H. W. N. Y. H M	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. Sun rises H M	Sun sets. H M	Moon sets. H M
1	T	8 1 47	5 24	6 36	sets.	11 46	5 27	6 33	sets	8 32	5 29	6 31	sets.
2	F	7 39 50	5 26	6 35	6 56	morn.	5 28	6 32	6 56	9 9	5 30	6 30	6 57
3	S	7 17 46	5 27	6 33	7 23	0 23	5 29	6 30	7 25	9 46	5 31	6 28	7 26
4	B	6 55 35	5 28	6 31	7 52	1 0	5 30	6 29	7 55	10 22	5 32	6 27	7 57
5	M	6 33 16	5 29	6 30	8 24	1 36	5 31	6 27	8 27	11 0	5 33	6 25	8 30
6	T	6 10 52	5 30	6 28	9 1	2 14	5 32	6 26	9 4	11 44	5 34	6 24	9 8
7	W	5 48 21	5 31	6 26	9 42	2 58	5 33	6 24	9 46	morn	5 35	6 23	9 51
8	T	5 25 45	5 32	6 25	10 31	3 48	5 34	6 23	10 35	0 34	5 35	6 21	10 40
9	F	5 3 3	5 33	6 23	11 27	4 44	5 35	6 21	11 32	1 30	5 36	6 20	11 36
10	S	4 40 16	5 34	6 21	morn.	5 48	5 36	6 19	morn.	2 34	5 37	6 18	morn.
11	B	4 17 25	5 35	6 19	0 29	6 56	5 36	6 18	0 33	3 42	5 38	6 17	0 37
12	M	3 54 29	5 36	6 17	1 38	8 2	5 37	6 16	1 41	4 48	5 39	6 15	1 45
13	T	3 31 28	5 37	6 16	2 50	9 6	5 38	6 14	2 52	5 52	5 40	6 13	2 55
14	W	3 8 24	5 38	6 14	4 5	10 4	5 39	6 12	4 6	6 50	5 40	6 12	4 8
15	T	2 45 16	5 39	6 12	rises	10 54	5 40	6 10	rises	7 40	5 41	6 10	rises.
16	F	2 22 6	5 40	6 11	6 25	11 41	5 41	6 8	6 26	8 27	5 42	6 9	6 28
17	S	1 58 52	5 41	6 9	7 2	ev. 31	5 42	6 7	7 5	9 17	5 43	6 7	7 7
18	B	1 35 36	5 42	6 7	7 43	1 18	5 43	6 5	7 46	10 4	5 44	6 5	7 49
19	M	1 12 17	5 43	6 5	8 26	2 2	5 44	6 4	8 30	10 48	5 44	6 4	8 34
20	T	0 48 57	5 44	6 4	9 15	2 54	5 45	6 2	9 20	11 40	5 45	6 2	9 24
21	W	0 25 35	5 45	6 2	10 7	3 49	5 46	6 1	10 11	ev. 35	5 46	6 1	10 16
22	T	0 2 4	5 46	6 0	11 0	4 46	5 47	5 59	11 4	1 32	5 47	5 59	11 9
23	F	S. 21 12	5 47	5 58	11 57	5 45	5 48	5 57	morn.	2 31	5 48	5 57	morn.
24	S	0 44 37	5 48	5 56	morn	6 43	5 49	5 55	0 1	3 29	5 49	5 55	0 5
25	B	1 8 2	5 49	5 54	0 51	7 37	5 50	5 53	0 54	4 23	5 50	5 53	0 58
26	M	1 31 27	5 50	5 52	1 49	8 29	5 51	5 52	1 51	5 15	5 51	5 52	1 54
27	T	1 54 51	5 51	5 50	2 46	9 17	5 52	5 50	2 48	6 3	5 52	5 51	2 50
28	W	2 18 15	5 53	5 49	3 43	10 0	5 53	5 49	3 44	6 46	5 53	5 49	3 45
29	T	2 41 37	5 54	5 46	4 40	10 38	5 54	5 47	4 40	7 24	5 54	5 47	4 40
30	F	3 4 58	5 55	5 45	sets	11 14	5 55	5 45	sets.	8 0	5 55	5 45	sets.

numbers in the first case will be in the same ratio to each other, as the resulting numbers in the last case. These three facts were discovered by Kepler, and are called Kepler's laws. From these it is easily shown, by higher mathematics, that the only force acting on the heavenly bodies is an attraction toward the sun, proportioned in its intensity to the square of the distance from the sun. It is further shown, by simple arithmetical calculations, that this force is the very same as that which causes an apple to fall to the ground. A stone falls 193 inches in a second, and the moon in going round the earth, at the distance of 238,650 miles, must bend from a straight line .053 of an inch every second. But the moon is 60 times as far from the earth's centre as the stone is, and 193 divided by 60 times 60 gives .053. This discovery of the identity of the force of gravity, or the

10th MONTH. # OCTOBER, 1864. **31 DAYS.**

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
First Quarter,	8	10 53 m	10 41 m	10 29 m	1	11 49 27
Full Moon,	15	1 31 m	1 19 m	1 7 m	9	11 47 8
Third Quarter,	22	6 43 m	6 31 m	6 19 m	17	11 45 17
New Moon,	30	10 44 m	10 32 m	10 20 m	25	11 44 6

			CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'a, Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
DAY OF MONTH.	DAY OF WEEK.	Sun's declens. S.	SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	S	3 28 27	5 56	5 43	5 55	11 51	5 56	5 43	5 57	8 37	5 56	5 44	5 59
2	B	3 51 43	5 57	5 42	6 27	morn.	5 57	5 42	6 30	9 18	5 57	5 42	6 33
3	M	4 14 46	5 58	5 40	7 2	0 36	5 58	5 41	7 6	9 58	5 58	5 41	7 9
4	T	4 37 57	5 59	5 39	7 43	1 12	5 59	5 39	7 47	10 38	5 59	5 39	7 51
5	W	5 1 4	6 1	5 38	8 28	1 52	6 0	5 37	8 33	11 22	6 0	5 38	8 37
6	T	5 24 8	6 2	5 36	9 20	2 36	6 1	5 36	9 25	morn	6 1	5 37	9 29
7	F	5 47 7	6 3	5 34	10 20	3 29	6 2	5 34	10 24	0 15	6 2	5 35	10 29
8	S	6 10 1	6 4	5 33	11 23	4 25	6 3	5 33	11 27	1 11	6 3	5 34	11 31
9	B	6 32 51	6 5	5 31	morn.	5 28	6 4	5 31	morn.	2 14	6 4	5 32	morn.
10	M	6 55 35	6 6	5 29	0 31	6 32	6 5	5 29	0 34	3 18	6 5	5 31	0 37
11	T	7 18 14	6 8	5 28	1 42	7 39	6 6	5 28	1 44	4 25	6 6	5 30	1 46
12	W	7 40 46	6 9	5 26	2 54	8 42	6 7	5 26	2 55	5 28	6 7	5 29	2 56
13	T	8 3 12	6 10	5 24	4 6	9 39	6 8	5 25	4 6	6 25	6 8	5 27	4 6
14	F	8 25 32	6 11	5 22	rises	10 31	6 9	5 23	rises.	7 17	6 9	5 25	rises.
15	S	8 47 44	6 12	5 20	5 34	11 18	6 10	5 22	5 37	8 4	6 10	5 24	5 40
16	B	9 10 49	6 13	5 19	6 17	ev. 8	6 11	5 20	6 21	8 54	6 11	5 22	6 25
17	M	9 31 46	6 14	5 17	7 4	0 57	6 12	5 19	7 8	9 43	6 12	5 20	7 12
18	T	9 53 35	6 15	5 16	7 56	1 43	6 13	5 17	8 1	10 29	6 13	5 19	8 5
19	W	10 15 15	6 17	5 14	8 51	2 31	6 14	5 16	8 55	11 17	6 14	5 17	9 0
20	T	10 36 46	6 18	5 13	9 46	3 24	6 15	5 15	9 50	ev. 10	6 15	5 16	9 54
21	F	10 58 8	6 19	5 11	10 44	4 15	6 16	5 13	10 47	1 1	6 16	5 15	10 51
22	S	11 19 20	6 21	5 10	11 40	5 9	6 18	5 12	11 43	1 55	6 17	5 14	11 46
23	B	11 40 22	6 22	5 8	morn.	6 4	6 19	5 10	morn.	2 50	6 18	5 13	morn.
24	M	12 1 13	6 23	5 7	0 37	6 56	6 20	5 8	0 39	3 42	6 19	5 12	0 41
25	T	12 21 54	6 24	5 5	1 34	7 44	6 21	5 7	1 35	4 31	6 20	5 10	1 36
26	W	12 42 23	6 25	5 4	2 30	8 36	6 22	5 5	2 31	5 22	6 21	5 9	2 31
27	T	13 2 40	6 27	5 2	3 28	9 20	6 24	5 4	3 27	6 6	6 22	5 7	3 26
28	F	13 22 45	6 28	5 1	4 26	10 4	6 25	5 3	4 25	6 50	6 23	5 5	4 23
29	S	13 42 37	6 29	5 0	5 24	10 45	6 26	5 2	5 23	7 31	6 24	5 4	5 20
30	B	14 2 16	6 31	4 58	sets	11 23	6 27	5 0	sets.	8 9	6 25	5 3	sets.
31	M	14 21 42	6 32	4 57	5 41	morn	6 28	4 59	5 44	8 53	6 26	5 2	5 49

weight of bodies on earth, with the cosmical force that carries the heavenly bodies in their orbits, is due to Sir Isaac Newton. The bodies already mentioned are all that are known to belong to the solar system, although there are strong probabilities that our own planet, the earth, is surrounded with a vast group of minute satellites, rotating about the earth at a less distance than that of the moon, a discovery of the Rev. George Jones, U. S. N. This asteroid group of terrestrial moons is best seen on fine evenings in February and March, as a faint cone of light stretching up from the west, which has been called the zodiacal light.

The fixed stars are at vastly greater distances from us than any parts of the solar system and are probably of the same nature as the sun itself. The stars appear to lie in a flattened cluster, with our solar system

11th MONTH. # NOVEMBER, 1864. **30 DAYS.**

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
First Quarter, ...	6	7 9 e	6 57 e	6 45 e	1	11 43 42
Full Moon, ...	13	0 49 e	0 37 e	0 25 e	9	11 44 2
Third Quarter, ...	21	2 32 m	2 20 m	2 8 m	17	11 45 16
New Moon, ...	29	2 33 m	2 21 m	2 9 m	25	11 47 23

			CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
DAY OF MONTH.	DAY OF WEEK.	Sun's declens. S.	SUN rises	SUN sets.	MOON sets.	H. W Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets.	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	14 40 54	6 33	4 55	6 26	0 7	6 29	4 59	6 30	9 37	6 27	5 1	6 35
2	W	14 59 52	6 34	4 54	7 17	0 51	6 30	4 58	7 22	10 22	6 28	5 0	7 26
3	T	15 18 35	6 35	4 53	8 14	1 36	6 31	4 57	8 19	11 8	6 29	4 59	8 23
4	F	15 37 2	6 36	4 52	9 17	2 22	6 32	4 56	9 20	12 0	6 30	4 58	9 24
5	S	15 55 15	6 37	4 50	10 22	3 14	6 33	4 55	10 25	morn	6 31	4 57	10 28
6	B	16 13 11	6 39	4 49	11 31	4 9	6 35	4 53	11 33	0 55	6 32	4 56	11 35
7	M	16 30 51	6 40	4 48	morn.	5 9	6 36	4 52	morn.	1 55	6 33	4 55	morn.
8	T	16 48 14	6 41	4 47	0 39	6 10	6 38	4 50	0 40	2 56	6 35	4 54	0 41
9	W	17 5 20	6 43	4 45	1 50	7 13	6 39	4 49	1 50	3 59	6 36	4 53	1 50
10	T	17 22 8	6 44	4 44	3 1	8 14	6 40	4 48	3 0	5 0	6 37	4 52	2 59
11	F	17 38 39	6 45	4 43	4 12	9 14	6 41	4 47	4 10	6 0	6 39	4 51	4 8
12	S	17 54 51	6 47	4 42	5 22	10 8	6 43	4 46	5 19	6 54	6 40	4 50	5 16
13	B	18 10 44	6 48	4 41	rises	10 58	6 44	4 45	rises	7 44	6 41	4 49	rises.
14	M	18 26 18	6 49	4 40	5 42	11 46	6 45	4 44	5 46	8 32	6 42	4 48	5 51
15	T	18 41 33	6 51	4 39	6 35	ev. 38	6 47	4 43	6 40	9 24	6 43	4 47	6 44
16	W	18 56 28	6 52	4 38	7 32	1 24	6 48	4 42	7 36	10 10	6 44	4 46	7 40
17	T	19 11 2	6 53	4 37	8 31	2 6	6 49	4 41	8 34	10 52	6 45	4 46	8 38
18	F	19 25 16	6 54	4 36	9 35	2 54	6 50	4 40	9 38	11 40	6 46	4 45	9 41
19	S	19 39 9	6 55	4 36	10 26	3 41	6 51	4 40	10 29	ev. 27	6 47	4 44	10 31
20	B	19 52 40	6 56	4 35	11 24	4 29	6 52	4 39	11 26	1 15	6 48	4 44	11 27
21	M	20 5 50	6 58	4 34	morn.	5 16	6 54	4 38	morn.	2 2	6 49	4 43	morn.
22	T	20 18 38	6 59	4 33	0 21	6 7	6 55	4 38	0 21	2 53	6 50	4 42	0 22
23	W	20 31 3	7 0	4 33	1 18	6 58	6 56	4 37	1 18	3 44	6 51	4 42	1 17
24	T	20 43 5	7 1	4 32	2 14	7 48	6 57	4 36	2 13	4 34	6 52	4 41	2 13
25	F	20 54 45	7 3	4 31	3 14	8 40	6 58	4 36	3 12	5 26	6 53	4 41	3 10
26	S	21 6 0	7 4	4 31	4 12	9 27	6 59	4 35	4 9	6 13	6 54	4 41	4 7
27	B	21 16 52	7 5	4 30	5 14	10 16	7 0	4 34	5 10	7 2	6 55	4 41	5 7
28	M	21 27 20	7 6	4 29	sets	10 57	7 1	4 34	sets.	7 43	6 56	4 40	sets.
29	T	21 37 24	7 7	4 29	5 9	11 45	7 2	4 33	5 14	8 31	6 57	4 40	5 18
30	W	21 47 2	7 9	4 29	6 6	morn.	7 4	4 33	6 10	9 22	6 58	4 40	6 15

somewhere near the middle of it. The stars in the edge of this cluster, of course, appear to us crowded, and the more distant ones are beyond the reach of unassisted sight, their light blending into a whitish cloud, called the milky way. All the stars appear to be revolving about a central point in the constellation of the Pleiades. The change of apparent position in a heavenly body, caused by our moving our position, is called parallax. For the bodies of the solar system there is a daily parallax, arising from our rotation, about the axis of the earth. For the stars the daily parallax is insensible, and even the parallax caused by our moving around the sun, in the immense orbit of 191,000,000 miles in diameter, is so small, that it has with difficulty been measured in a very few stars. Variable stars are those which go through regular periodical changes of brilliancy, from some unknown causes. There are several well attested instances of the appearance of

12th MONTH. **DECEMBER, 1864.** **31 DAYS.**

MOON'S PHASES.	D	Boston. H M	N. York. H M	Wash'ton H M	Sun on Meridian or Noon Mark. D	H M S
First Quarter, ...	6	2 50 m	2 38 m	2 26 m	1	11 49 30
Full Moon, ...	13	2 28 m	2 16 m	2 4 m	9	11 52 53
Third Quarter, ...	20	0 18 m	0 6 m	11 54 e	17	11 56 41
New Moon, ...	28	4 37 e	4 25 e	4 13 e	25	12 0 11

			CALENDAR For Boston, N. England, New-York State, Michigan, Wiscon., Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., New Jersey, Penn'ia, Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
DAY OF MONTH.	DAY OF WEEK.	Sun's declens. S.	SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	21 56 15	7 10	4 29	7 7	0 36	7 5	4 34	7 11	10 9	6 59	4 40	7 25
2	F	22 5 4	7 11	4 29	8 14	1 23	7 6	4 34	8 17	10 53	7 0	4 39	8 21
3	S	22 13 26	7 12	4 28	9 13	2 7	7 7	4 34	9 16	11 45	7 1	4 39	9 18
4	B	22 21 23	7 13	4 28	10 31	2 59	7 8	4 33	10 33	morn	7 2	4 39	10 35
5	M	22 28 53	7 14	4 28	11 40	3 51	7 9	4 33	11 41	0 37	7 3	4 38	11 41
6	T	22 35 58	7 15	4 28	morn.	4 47	7 10	4 33	morn.	1 33	7 4	4 38	morn.
7	W	22 42 35	7 16	4 28	0 49	5 47	7 11	4 33	0 49	2 33	7 5	4 38	0 48
8	T	22 48 46	7 17	4 28	1 58	6 49	7 12	4 33	1 57	3 35	7 6	4 38	1 55
9	F	22 54 30	7 18	4 28	3 6	7 51	7 13	4 33	3 4	4 37	7 7	4 38	3 1
10	S	22 59 46	7 19	4 28	4 14	8 51	7 14	4 33	4 11	5 37	7 8	4 38	4 7
11	B	23 4 36	7 20	4 28	5 4	9 49	7 15	4 33	5 17	6 35	7 9	4 38	5 13
12	M	23 8 57	7 21	4 28	rises	10 40	7 15	4 33	rises.	7 26	7 10	4 39	rises.
13	T	23 12 51	7 22	4 28	5 18	11 26	7 16	4 33	5 22	8 12	7 10	4 39	5 27
14	W	23 16 18	7 22	4 28	6 15	ev. 15	7 17	4 34	6 19	9 1	7 11	4 39	6 23
15	T	23 19 16	7 23	4 28	7 15	1 0	7 17	4 34	7 18	9 46	7 11	4 39	7 22
16	F	23 21 47	7 24	4 28	8 14	1 40	7 18	4 34	8 17	10 26	7 12	4 39	8 19
17	S	23 23 49	7 24	4 29	9 11	2 20	7 18	4 34	9 13	11 6	7 12	4 40	9 15
18	B	23 25 23	7 25	4 29	10 9	3 3	7 19	4 35	10 10	11 49	7 13	4 40	10 11
19	M	23 26 29	7 25	4 29	11 6	3 46	7 19	4 35	11 6	ev. 32	7 13	4 40	11 6
20	T	23 27 7	7 26	4 30	morn	4 31	7 20	4 36	morn.	1 17	7 14	4 41	morn.
21	W	23 27 16	7 26	4 30	0 2	5 17	7 20	4 36	0 1	2 3	7 14	4 41	0 1
22	T	23 26 57	7 27	4 31	1 0	6 9	7 21	4 37	0 58	2 55	7 15	4 42	0 57
23	F	23 26 10	7 27	4 31	1 57	7 2	7 21	4 37	1 55	3 48	7 15	4 42	1 53
24	S	23 24 54	7 28	4 32	2 57	7 56	7 22	4 38	2 54	4 43	7 16	4 43	2 52
25	B	23 23 10	7 28	4 32	3 58	8 53	7 22	4 38	3 54	5 39	7 16	4 43	3 50
26	M	23 20 57	7 29	4 33	4 59	9 49	7 23	4 39	4 55	6 35	7 17	4 44	4 51
27	T	23 18 17	7 29	4 34	5 58	10 40	7 23	4 39	5 53	7 26	7 17	4 45	5 49
28	W	23 15 8	7 29	4 34	sets.	11 26	7 24	4 40	sets.	8 12	7 18	4 45	sets.
29	T	23 11 32	7 29	4 35	5 58	morn.	7 24	4 40	6 2	9 5	7 18	4 46	6 6
30	F	23 7 27	7 30	4 36	7 9	0 19	7 25	4 41	7 12	9 53	7 19	4 47	7 15
31	S	23 2 55	7 30	4 37	8 20	1 7	7 25	4 42	8 22	10 38	7 19	4 48	8 24

temporary stars, the permanent accession of new stars to the sky, and the permanent loss of stars which have become invisible. Double stars are simply those which appear to be one nearly behind another. Binary stars are those which are actually near each other and revolve about their common centre of gravity, as the earth and moon about theirs. Nebulæ are clusters of stars, which require very high powers of a telescope to resolve into stars; that is, under low powers of a telescope they appear like portions of the milky way. It is usually supposed that they are large clusters entirely distinct from that in which our solar system is placed, and, if so, at a distance which is incredibly great.

The foregoing remarks give a bird's-eye view of the field of physical astronomy.—[Appleton's New American Cyclopædia.

THE

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.

DOING WORK IN ITS SEASON.

A MOST important element for success, in farming, is doing every thing in its season. Delays not only cause confusion in the great system of operations, but often greatly increase labor as well as lessen the products of land. For these reasons, it becomes a matter of much importance to the cultivator that brief memoranda of the labors of each month be laid before him, that he may perceive at a glance what points particularly demand his present attention. With this view the following suggestions for farm work are offered to the readers of the REGISTER.

It is intended, in future numbers, to take up successively the various subjects of Gardening, Fruit Raising, &c., in the same way.

Work for January.

Plans should be now made for the coming year. If not already accomplished, prepare to lay out the farm in regular fields, and introduce a good rotation—which will enable the farmer to carry on all his labor with clock-work regularity, to keep clean fields, to preserve their fertility, and to prevent

confusion, so often resulting from too much work for the force at particular periods. For full directions for laying out farms, with illustrations, see RURAL AFFAIRS, Vol. I, pp. 105, 233, and Vol. II, p. 132; and on Rotation, see Vol. I, pp. 102, 235.

There are a number of points to which the skillful farmer should direct his attention, before the spring work opens.

One of the most important is to prepare for FARM ACCOUNTS, by procuring suitable Blank Books and arranging the Headings. He should have a Memorandum Book to carry always in his pocket, to note down any thing that occurs to him, at the moment, and before forgotten. Each field or crop should have a page devoted to it, and all outlays and profits should be carefully recorded. His farm should be well laid out, measured and mapped; which will be a pleasant winter's task. And his granaries should be accurately measured and graduated, to show quickly the number of bushels of contents. A scale for weighing his domestic animals will pay for itself every year, in the information it will afford him in relation to feeding.

He should keep accurate accounts with all his neighbors, if he would avoid difficulties; and all his accounts, both with his fields and otherwise, should be a model of neatness, distinctness, and systematic order.

FARM LABORERS should be hired in season, as the best will always be engaged early; and it often happens that by paying a dollar or two more per month, a greater amount in valuable assistance will be secured—or, in other words, the best are generally the cheapest.

Keep all BARNS and SHEDS clean and in order, and prevent the untidy accumulations and confusion which some premises witness. Keep all tools under shelter, provide a place for every thing, and let every thing be in its place; and do not allow hens to roost on wagons, horse-rakes, and carriages.

If CORNSTALKS can be cut very short by horse-power, before feeding to cattle, a large amount of saving will be effected.

Let CATTLE and all other animals be kept perfectly clean, comfortable, and sufficiently warm. If they occupy sheds, great care should be taken to prevent cold currents between the boards, and especially under the sills, and high fenees or other screens should prevent all winds from blowing in the front side. If kept in stables, still greater care should be exercised to preserve cleanliness and to provide sufficient ventilation. Many denounce stables for cattle on account of the foul air and foul keeping they are subjected to; while others denounce sheds on account of the cold currents which sweep through them. Use the curry-comb freely and regularly on both cattle and horses.

CELLARS UNDER DWELLINGS should be frequently examined and kept scrupulously clean; the walls may be whitewashed in winter. Where there is danger of the ingress of frost at the windows, it is neater to provide double windows, (on hinges, to hook up,) than the more unsightly stuffings of

straw. Pick over apples in cellars, and if there is an abundant supply, feed out those which threaten decay, in regular quantities, to milch cows.

Fill ICE-HOUSES. Cheap ones may be quickly constructed, in the form of strong board shanties, (fig. 2,) with a good but not tight floor. Place a few inches of sawdust on the floor, pile up the ice compactly in square blocks, leaving a space of 8 to 12 inches all around, next to the boards, to be filled with sawdust, trodden in, as the structure of ice is built upwards. Cover the whole with 8 or 10 inches of sawdust, and let plenty of fresh air blow through the shanty over the top. Ice will keep in this way as well as in the most costly and elaborate building. Chaff or finely cut straw may be substituted for the sawdust; but being less perfect non-conductors, should be in thicker layers. Ice-houses built of boards, with double walls, (fig. 3,) filled in with sawdust, although they do not keep ice better than those just described, save some labor by obviating the removal of the sawdust every time they are filled with ice. But even these should have a thin stratum of sawdust, say three or four inches, between the walls and the ice, which should be filled in and pressed hard as each layer is laid. The accompanying plans and views show the construction of these buildings. It will be seen in the view of the double walled house, that a large ventilating window is placed in each end at the top; these windows should always be open. There are

Fig. 2.—ROUGH OR SHANTY ICE-HOUSE, left open under the eaves for ventilation.

Fig. 3.—ICE-HOUSE, ABOVE GROUND. One Door is enough for common sized Houses.

Fig. 4.—Plan of Single-Wall or Board Ice House.

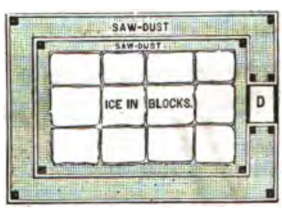


Fig. 5.—Plan of Double-Wall Board Ice-House.

two double doors at one end in large building, and one in small one—these are for filling and taking the ice out at different heights. Care should be taken that all the sawdust be pressed solid, and no cavities left. An ice-house with one apartment, 8 by 10 feet, and 6 feet high, (including a foot of sawdust all around,) will keep ice enough for a moderate family.

Use carefully every means for saving MANURE. If straw is abundant, work it in freely as litter, and use it for absorbing liquid portions. If muck is accessible, scatter it over the yard, or use it in compost heaps, in thin alternating layers with manure. Dead animals, bones, &c., should all go to the compost heap. Fresh manure may be now drawn out and spread evenly on grass lands—either as a top-dressing for meadows and pastures, or on the corn crop on sward to be inverted in spring. (There is little danger of manure being thus wasted by washing away, as the soil, when the first thaw occurs, will quickly absorb all the soluble parts as they flow over its surface.)

FUEL.—Draw, cut and split wood for summer use, so that there may be no interruption after the spring opens. If the wood is to be drawn only a mile or two, the best way is to cut and draw a large quantity at a time, and saw it with a circular saw by means of horse-power. Then, immediately split and pile it, and it will season into fuel of the best quality—much superior to that which remains uncut for many months, until it becomes partly decayed.

FENCING.—Rails split and seasoned in summer, are much more durable than those split in winter, but they may now be drawn and prepared for use.

One of the cheapest and best kinds of fence is made of post and rail. In constructing this fence, as many readers know, the posts are set two and a quarter to two and a half feet deep, and each length of rails inserted before the next post is fixed in its position. The rails cannot then be displaced so long as the fence stands. The rails being cut wedge-form at the ends, pass each other in the holes, and if coated with gas-tar when entering, the fence would be rendered more durable. This kind of fence may be made for eighty cents to one dollar per rod. The posts may be prepared by hand labor on rainy or stormy days in winter. One of the best frames for holding the posts is shown in the accompanying figure, (6.) It consists of a frame, *a*, *b*, *c*, made of scantling, and placed horizontally on four stout legs. This is the support of the machine. On this is another frame, *d*, *e*, *f*, which may slide backwards and forwards, and which receives the post to be bored. The

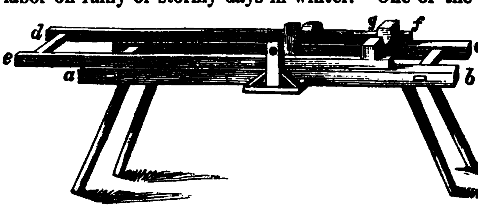


Fig. 6.—FRAME FOR HOLDING POSTS.

post is wedged into the space *g*, and the auger being inserted into the two holes shown at the middle of the frame, it is driven through the post by turning the handle or winch. Marks are made on the sliding frame, to show the precise place to bring the posts, so that all may be bored alike—the auger remaining fixed. Fig. 7 shows the bed piece for receiving the post on a larger scale. Fig. 8 exhibits the contrivance for securing the post firmly to its position for hewing or dressing with the axe—a cavity being made in a log for receiving it, when the iron point driven in secures it.

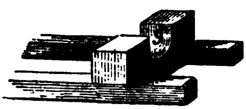


Fig. 7.

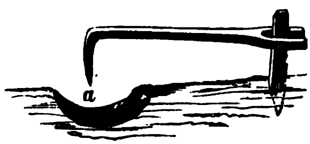


Fig. 8.

An important improvement might probably be made in the boring frame by placing it in a slightly inclined position, (as by shortening the legs on one side,) so that when a fly-wheel is attached to the auger, its weight would cause it to descend into the post. This fly-wheel might be a common grindstone, in the absence of anything better, attached to the auger.

Rats and Mice should be exterminated from all farm buildings. A few good cats are the best and most easily set traps. Rat-holes in cellars may be stopped by a mixture of hydraulic cement and broken bottles.

Sheep should be kept under sheds, and their fine condition maintained by a feeding of about half a pint of corn daily to each, giving less early in winter, and more towards spring. A small regular feeding of roots would assist in keeping up their excellent condition. Directions for constructing sheep racks, with illustrations, may be found on p. 289, Vol. II, of Rural Affairs.

Corn keeps best on the cob. Shell such only as is needed for winter use. The second quality, or smaller ears, if kept in narrow, well ventilated cribs, will make good food for commencing the fattening of swine next autumn.

Selection of Tools.—As farmers will probably find a scarcity of labor next summer, the difficulty may be remedied in part by procuring the very best tools of all kinds. The most costly will be the cheapest. A hand-hoe, for example, that will enable a laborer to do one-quarter more work, will pay its additional cost every day of the entire month it is used. Plans for the arrangement of tools in rooms may be found on page 131, of the Register for 1862; or Rural Affairs, Vol. III, p. 131.

Snow on Roofs, which often accumulates in eave-troughs, prevents the escape of rain or melting snow, and damming up, flows through the shingles and passes down through the house, should be timely scraped off, which may be done by the assistance of a ladder and a long-handled hoe.

Soot in Chimneys should be burned or scraped out when the roof is wet, and thus prevent danger of fire by burning cinders falling out on the dry shingles, whenever the soot may accidentally take fire.

WEEKLY DISCUSSIONS.—Farmers will receive much valuable local information by instituting weekly discussions among their neighbors. A moonlight evening may be well spent in this way at a district school house or town hall, and the agriculture of the district improved, and a neighborly feeling promoted. A part of the time might be well spent by reading short extracts from agricultural papers and discussing their merits.

Work for February.

Continue the labors of the winter, and prepare for the summer's campaign. Attend constantly to the comfort of domestic animals. Draw out and spread manure on grass lands; or pile it up and make compost heaps of it, (fig. 9,) in such fields as will need it. Fill ice-houses. Prune orchards. Cut grafts and pack them in damp moss or sawdust for spring use, taking care to have them correctly labeled. Lay plans for spring and for the entire season, so that men may be regularly employed at all times without crowding or confusion. Secure good farm laborers—the best are always engaged first—the highest priced are often the cheapest, by saving constant watching or superintendence. A dollar or two more per month will often secure several dollars more in labor or its equivalent, good management. Open drains or channels in wheat-fields, which have become choked by snow or ice, should be cleared out on the approach of thawing weather. Cattle should be kept off meadows. Horses with heaves may be relieved by feeding with wet, cut feed, especially if fine, well cured cornstalks.

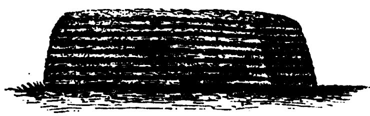


Fig. 9.—COMPOST HEAP, of alternating layers of turf and manure. (turf light, manure dark.) The thinner the layers, the more perfect the intermixture.

On stormy days pick over apples in cellars, and such as are beginning to decay, if abundant, may be regularly fed to cattle, horses and swine. Oil harness, make farm gates and ladders, and panels for hurdle fences.

Read carefully the directions for last month, which apply equally well at the present season.

Work for March.

Finish the various jobs of winter, and prepare to commence spring labor in earnest. Examine all tools, and put them in good order. Paint and grease carts and wagons. Examine and replace harrow teeth. Repair hinges of sagging gates, and nail loose boards on fences. Procure and clean grass seed for spring seeding. Examine and obtain a good supply of the best seed of oats, barley and spring wheat. See that teams are kept in good working order, and if they can be frequently used, half a day at a time, they will become better accustomed to the active labor of spring. Inspect thoroughly all the barns and out-buildings, and see that every part

is in good order. Oil harness, and repair it where necessary for spring work. Manufacture sugar, and for full directions see RURAL AFFAIRS, Vol. III, p, 241.

Sow clover seed early—it may be most accurately done on a thin snow, rendering the seed and footsteps visible. Plant early potatoes, for family use, as soon as the ground is thawed; if previously sprouted, in a warm place, an inch or two in length, they will come up sooner. Clean out cellars thoroughly. Give special care to the cows and calves. Look over the directions of the two previous months for additional suggestions.

Work for April.

FENCES.—One of the earliest tasks that can claim the farmer's attention is repairing fences. Systematic managers, whose farms are divided by common rail structures, after having determined about how long they will continue, say six years, divide their whole farm into six parts, and repair a sixth each year—this keeps all in good order without further trouble, and without having too much to attend to one season, and but little another. Board fences should be annually examined throughout their whole length, and loose boards nailed tight. New board fences should never be battened on the face or joints over the posts, as the practice tends to cause decay; but in the course of 15 or 20 years, when the ends begin to rot and become loosened, battens will secure and make them strong for several years longer. If farmers are able to replace their old worm fences with post and rail, board or stone fences, they should begin on one side and construct a certain amount each year, keeping a register of the same. Then, in future years, when repairs are needed, they can go through in the same way and in the same number of years.

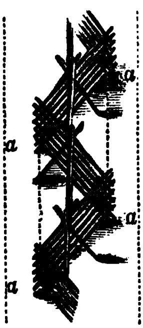


Fig. 10.—Best mode of staking common rail fences—vertical view.


Fig. 11.—Best Mode of Staking Common Rail Fences.

In many regions of the country the common crooked rail fence is extensively used, and cannot be immediately replaced by such better forms as board fences, stone walls, or post and rail fence. As commonly constructed with spreading stakes at each corner, it necessarily occupies a strip of ground nearly a rod wide. Vertical stakes, wired near the top, lessen the difficulty, but are not nearly so strong as when staked according to the mode shown in the above figures—seven rails high, and two riders besides, make a very strong fence, about seven feet high.

A good straight fence is sometimes made of split rails, and a common worm fence may be converted into one of this sort. It is composed of six rails for each length, and is about five feet high. It occupies more space

than a post or board fence, but much less than a worm fence. The accompanying cut, (fig. 12,) will show the mode of construction, and represents the place where the two lengths or rails meet. The uprights, which hold the rails to their place, are simply two sawed strips of wood, about five inches wide, an inch and a half thick, and five feet long—the length being equal to the height of the fence. They are connected by nailing blocks between them, leaving them about five inches apart. One of these blocks is at the bottom, the other within about a foot of the top. On the latter, the three top rails rest. Three large nails are driven at each place into the blocks. The fence is kept upright by a brace on each side, which also serves as an additional security in holding the uprights together. These braces are five feet long, about 18 inches of the lower end entering the earth. Three large nails secure the upper end to the uprights. They may be of sawed stuff, or split like common fence stakes. The lower ends of the uprights rest on a flat stone. It will be observed that no part is subjected to decay, except the braces, the lower ends of which enter the ground. These will need occasional renewing, unless of durable wood. All the rest will last as long as the rails, or thirty or forty years. If the nails, before using, are dipped in hot grease, oil or gas tar, they will not rust for a long time. The braces should press against the uprights about three feet high.

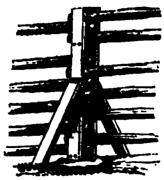


Fig. 12.—Cheap Fence.

Where unruly horses prove troublesome, by throwing off the riders of fences, the annoyance may be obviated by boring a small hole through the stake and passing a piece of annealed wire through this hole and around the rider. A day's work will thus secure a long line of fence, and may save many dollars loss.

The importance of good fences is well understood by those who have observed the difference between crops safe from all intruders, and those occasionally trodden down and ruined; between moving on with the work without interruption, and the frequent annoyance of stopping important operations to run after intruding cattle, colts and pigs.

Meadows.—As soon as these are dry enough to bear feet without injury to the turf, they should be carefully picked of all loose and projecting stones, which might injure a mowing machine, and then well rolled so as to make the surface as smooth and perfect as possible. Stumps should be dug or pulled out, accidental brush or other rubbish removed, and small hillocks leveled down. The farmer who has seen a mowing machine broken, at a cost of five dollars, and a delay of a day, by a stone that might have been removed in five minutes, will appreciate the importance, comfort and economy, of a smooth surface. There is some satisfaction in the reflection that new farm machinery is going to compel the adoption of a smoother and more perfect kind of farming.

Much is lost by the imperfect, thin and uneven seeding of meadows. Bare spots and thin grass, amounting as they very often do to one-fourth of the whole surface, would make a total loss of five acres in every twenty-acre meadow. Sometimes the loss amounts to much more. The importance of thick and even seeding is not sufficiently appreciated. Thin or bare patches in existing meadows may be covered with grass by running over the meadow with a fine-tooth harrow the first day the surface is dry, then sowing a mixture of clover and timothy, and rolling the seed in. If the meadow has been top-dressed with fine manure in autumn or winter, the harrowing will mix it with the surface, and assist the germination of the seed, as well as its subsequent vigorous growth.

Fig. 13.—Grass or Meadow unevenly and thinly seeded.

Meadows which were top-dressed with coarse manure in autumn or winter, which was more or less spread in lumps, should be harrowed as early as possible, so as to break those lumps and spread the whole uniformly. Cattle droppings, on meadows or pastures, should be finely beaten to pieces and well scattered over the surface, as soon as the frost will admit, and before the frost has all disappeared from the soil. It is scarcely necessary to mention that no good farmer ever allows either his meadows or pastures to be touched by a hoof early in spring, while the ground is soft.

Fig. 14.—Grass or Meadow evenly and thickly seeded.

Teams.—Every good manager has already taken care to have his teams in excellent order for the heavy work of spring—but as they have not been much accustomed to hard and steady work, it would be advisable to plow only half a day at a time with them at first, until they become well accustomed to it, using them the other half days for job work, light teaming, &c. A little care in this respect will often prevent sore shoulders and reduced condition. The harness should be examined frequently, to see that it fits well, and to prevent chafing. It will be observed that when horses are plowing the traces draw downward, and when attached to a wagon, horizontally; the back straps should therefore be lengthened a little when they are removed from the wagon to the plow.

Fig. 15.—Cut and Cover Slices.

Plowing.—Light or gravelly soils, which quickly become dry, may be plowed at almost any time; but rich loams should be taken at precisely the right period. If plowed too early,

while yet wet, they may become poached and injured for the season. If left too late, the spring rains may have settled back what the frosts of winter have loosened. Plowing WELL saves much labor in subsequent tillage. Narrow furrow slices, (except with sward,) pulverize the soil more perfectly, and leave a beautiful mellow surface. Furrows seven or eight inches deep, and only six inches wide, are easy for the team, and leave the land in very handsome condition.

Fig. 16.—Narrow Furrow Slices.

MANURE.—This may be applied with advantage to spring crops, if it is in such condition as to be pulverized finely. After spreading, it should always be thoroughly harrowed, and broken and intermixed with the top soil before plowing under. Coarse manure should be used in compost heaps. If very strawy, throw it up into heaps in the yard for remaining during the summer; if less strawy, draw it out to the fields where it is to be applied, and make compost heaps by thin alternating layers of turf or loam and manure.

CARROTS.—Failure often results with this crop by being planted too late—the seeds miss, the sun burns the plants. Get them in as early as possible, or as soon as the ground can be made thoroughly mellow. It does not pay to plant carrots on foul or weedy ground. The labor of hoeing will be too great, but if the ground is clean, rich and mellow, carrots may be made eminently profitable. Farmers often think it necessary to turn their animals on early grass, thus injuring the turf; but a supply of carrots in spring would give them all the advantages of green food, and none of its drawbacks.

BARLEY AND OATS.—Sow these as early as the seed can be put in, on well prepared land—we have known a delay of two weeks to lessen the crop equal to its entire nett profit.

POTATOES should also be planted early, for the great mass of experience is in favor of early planting to prevent rot.

CALVES.--The great secret of success in raising calves, after keeping them clean and comfortable, is very regular and uniform feeding, combined with nutritious food, and avoiding all sudden changes in their food. On the whole, it is best to wean them very early, as they will then never suck the cow again, nor themselves. Their food may at first be new milk, then warm skimmed milk, then skimmed milk with meal intermixed, thus passing from new milk to common food with meal, and being especially careful that all these changes should be very gradual, and almost imperceptible.

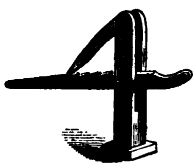


Fig. 17.—Wagon Jack.

WHEAT CROPS.—Red root and cockle should be pulled early, and not a vestige of either left.

RAINY DAYS.—Clear out all rubbish from cellars, and keep them clean and well purified. Grease wagons, oil harness, brush

up stables, examine and render perfectly clean all seed for sowing and planting. Examine and repair tools, and have them all in perfect order for the busy season now about to commence. Prepare account books, and keep an accurate account with every field.

ORCHARDS AND SHADE TREES.—The enterprising farmer should not forget these. The time for planting may vary considerably with circumstances—if they have been dug up early, before the buds have swollen, and have been well heeled in, they may be set out safely, even after the leaves on standing trees have begun to appear. The great point is to take up the ROOTS with them; they are commonly nearly all left behind; stems and tops are not of much value without roots. If this point has been carefully attended to, and the roots have been well spread out in every direction when set, and placed compactly in fine earth, they cannot fail to grow; there is no use in losing one in a thousand. After that, the great requisite is to keep the surface mellow and well cultivated.

Work for May.

The prominent labors of this month are the completion of sowing spring crops, where this has not been already done, and planting hoed crops.

CORN.—The amount of this crop raised is more controled by good and bad management than almost any other. Many farmers are satisfied with 30 bushels per acre—they should average at least 80 bushels—over 100 may be often reached. The requisites for success are a well prepared, rich soil, and constant and clean cultivation. The former claims especial attention at present. A sward inverted to a moderate depth is a favorite mode of planting; it succeeds admirably if it has been well manured on the surface the previous autumn, the rains carrying the enriching portions into the soil. On good ground this will often make a difference of 20 to 25 bushels per acre. Inverting the whole sod perfectly will save much hand hoeing. Rolling and then harrowing lengthwise with the sod is the common mode; but Share's harrow, (if made with steel teeth,) accomplishes both these operations in one, and mellows the soil twice as deep as common harrowing. Mark the rows perfectly straight and even—this will allow the horse cultivator to run closely to the rows. In strong or heavy soils never plant over an inch deep—in light soils not over an inch and a half. Experiments have shown that beyond these depths the corn is smaller and longer in coming up. When manure is applied in spring, it should be fine and thoroughly intermixed by harrowing. In lumps it will be of little use.


Fig. 18.—Old Fashioned Scare-Crow.

The old fashioned way of frightening crows and blackbirds was the erection of effigies known as scare-crows, (fig. 18.) Cords

stretched across the field, if sufficiently numerous, will repel crows; but the best way is to tar the seed. To do this right, dash hot water on a half bushel of corn, which by draining off quickly will heat the surface of the grain without killing the germ. Then pour on a pint of hot tar—every grain will become thinly coated—then dust with air-slaked lime, which is best, or with plaster. No bird will touch the seed when planted. Gas tar cannot safely be substituted, as it often kills the germ, or coats it so that water cannot enter. Plant all missing hills with the earliest sorts, that all may ripen together.

Dropping concentrated manure into the hill gives the plants an early start, and increases the amount of the crop. As old corn is better than new for fall feeding, a substitute may be obtained by planting an early crop of the Early Canada, which will be hard and dry, while common corn is yet soft.

Potatoes.—To raise potatoes to a profit, it is important to avoid much hand hoeing. Let the ground be therefore perfectly clean. If mellow and smooth, it may be managed as follows: Plow furrows three feet apart, and drop the pieces a foot and a half in the row, then with a one-horse plow, or what is better, with a large toothed one-horse cultivator, the central tooth being removed, cover the row, leaving a ridge over it. Let it remain about two weeks, or just before the potatoes come up, then harrow the whole surface lengthwise. This will be as good as one thorough hoeing by hand. Potatoes planted 18 inches asunder in the row will give double nearly the amount obtained from hills three feet apart. No farmer should be satisfied with less than 300 bushels per acre of potatoes.

Roots.—Plant a good supply of field beets, carrots, rutabagas and parsnips. A daily supply of these in winter, mixed with dry food, will contribute largely to the health and thrift of domestic animals. Many farmers fail in raising these crops by not attending to the three essential requisites, viz: a rich soil, clear from weeds, and keeping the whole so well cultivated that weeds cannot start. All novices in raising rutabagas allow four times too many roots to grow. They should be thinned about a foot and a half apart, if the soil is as rich as it should be. Planting any of these crops on any other than a well enriched or manured soil, is a waste of land and labor.

Corn for Fodder, may be sown at the close of the month, for early cutting or for soiling—for either purpose, it should not all ripen at the same time. The best way is to sow

Fig. 19.
Light crop, sowed thin, in drills.

Fig. 20.
Heavy crop, sowed thick, in drills.

Fig. 21.
Light crop—effect of broadcast sowing.

in furrows or drills—by plowing, harrowing and marking out in furrows 3 feet apart, then strew the grain from the basket into the furrows by hand, at the rate of 3 bushels per acre, and cover with a harrow. Nothing farther will be needed, but passing the one-horse cultivator after the plants are up.

It is often sown too thin, making tall but coarse stalks, as in fig. 19; when sown broadcast it is apt to be weedy, as in fig. 21; but sown in thick drills, about 3 bushels per acre, as in fig. 20, is best.

BUCKWHEAT.—Although this crop is not sown for some weeks yet to come, the ground should be well prepared or mellowed for some time before hand. Let this preparation be not postponed until the last moment.

CALVES.—To raise good calves they should be fed the whole season, and one great secret of good management is to avoid any sudden changes in their food. (See the directions on this subject last month.)

SORGHUM.—This should be sown as early as the corn crop. Many cover the seed too deep. They are smaller than corn, and should never be buried more than an inch.

There are several operations of smaller importance which should not be overlooked. Fences around pastures should be strong and secure. Buildings and fences may be whitewashed now to advantage. The work should be done on a dry, warm day—when the whitewash will enter the pores of the wood. Painting, on the other hand, should be deferred till autumn, when the coat will harden better, and it will become more durable. Orchards, which were transplanted in autumn, should have the crusted soil about the young trees well broken and made mellow—it is leaving this hard crust untouched that has induced many to think that autumn planting for hardy trees is not so good as in spring. Coarse manure may be made into compost heaps for fall use. Mulleins and thistles should be dug up in pastures, and all early starting weeds should be destroyed.

CORN MARKERS.—There are various modes of marking corn for the straight rows described in the preceding article. One of the best markers is shown in the accompanying figure, (22) and consists of 3 runners, about 3 feet long, 6 inches wide, and 3 inches thick, placed 3½ feet apart, and well braced. A common wagon tongue may be attached to it. The driver walks behind the central runner, and ranges between the horses with his eye. The rows being 3½ feet apart, he employs stakes 10½ feet long to range by, and removes them as he passes, measuring accurately their length each time; or a second person may remove the poles. This marker steadied by the tongue

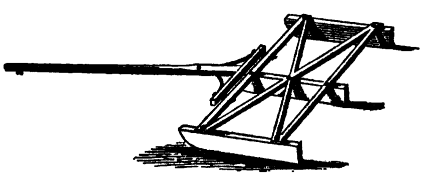


Fig. 22.—Corn Marker.

will form very straight grooves in the soil. For cross marking, employ the chain marker, shown in the cut, (fig. 23.) It consists of a light pole, with trace chains suspended from it, at distances for each row, or 3 or 3½ feet apart, as may be desired. Two men take the pole near each end, and one of them acting as guide and ranging accurately, they walk forward, dragging the chains in the soil, making a fine smooth line for each chain. The figure represents only five chains—six or seven may be employed without inconvenience, and the field marked off with great rapidity. By the first of these implements, a man and team will mark more than an acre, and by the use of the second, two men, or a man and boy, will mark 2½ acres, in walking a mile.

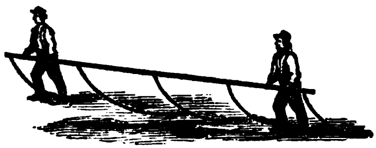


Fig. 23.—Marking Corn with Chains.

Work for June.

Corn Fodder.—Continue or finish the sowing of corn fodder, as described under last month. It will succeed if sown any time during the month. It is a great advantage to have a succession for soiling, in the dry part of autumn. By sowing large kinds early, and small or early varieties late, a long succession may be obtained. Any vacant ground may be well filled up with this crop, and if sown in furrows as already described, and cultivated twice, it will leave the ground, when harvested, clean and in fine condition, and the roots remaining will enrich the land. Hence the corn fodder crop may be regarded as one of the best for improving the soil.

Cultivating and Hoeing Corn.—Every farmer should endeavor to accomplish as much as possible by horse labor, and save hand hoeing. To this end the soil should previously be in as clean condition as practicable, and perfectly straight and even rows will allow the cultivator to pass closely to them. More corn will grow on an acre if planted in drills, or in thick rows of hills, in one direction; but when labor is scarce, it may be more economical on the whole to plant in hills both ways, unless the land should be unusually clean; the nearer the rows or hills can be to each other—that is, the more evenly distributed the corn is over the ground, the greater will be the crop, other things being equal. One of the best farmers we know, plants his corn 3 feet each way. His average is 80 bushels per acre; he has obtained 130, with high manuring and best management.

While it is desirable to employ enough hand labor to keep down every weed, the main reliance should be on horse culture—one horse accomplishing about as much as ten men. An excellent practice, which has proved very successful, especially in strong soils liable to become crusted, is to pass the cultivator once a week regularly, from the time it is up until too large to admit a horse between the rows.

Where there are missing hills in the cornfield, replant with an earlier sort, or plant three hills of bush beans to each hill of corn.

RUTA BAGAS.—These succeed well on all rich and rather light soils. Unless the soil be well enriched, it will be seed wasted and labor lost. They cannot be sown profitably without a good drill, which will plant several acres per day. In small experiments the seed may be dropped by nailing a tin cup to the lower end of a cane or stick, perforating the bottom with a small hole, a trifle larger than a seed, and shaking this with the seed along the drill, and covering by raking. This does well for garden crops. Never allow the weeds to become more than an inch high, and thin out the plaets to at least one foot apart in the drill, or a foot and a half in very rich land. All novices in raising this crop may be quickly known by leaving too many plants, which crowd and diminish each other in size.

Fig. 24.—Well Cultivated Root Crops.

Fig. 25.—Root Crops Grown among Weeds.

WEEDS.—Prompt and energetic destruction of weeds constitutes a prominent portion of the labors of this month. The great point is to take them early, when they are small and feeble. A weed in growing from an inch to a foot in height, increases as the cube, or a thousand fold in weight or bulk, and exhausts the soil correspondingly. Single weeds often produce 500 to 1,000 seed—sometimes several thousand. Scattering these over the soil occasions necessarily a great increase of labor another year.

HOES.—Procure the very best that can be had in market. The difference in price between a cheap and a good tool may be earned by the latter in a single day. Keeping hoes ground sharp will enable the laborers who use them to perform more and better work.

CLOVER SEED.—The first crop should be cut before the end of this month, or if pastured down, the animals should be removed at the same time.

SHEEP WASHING should be performed as early as the weather will safely admit—and after shearing, special care should be taken to shelter the sheep during cold storms.

If animals become bloated from eating fresh clover, the best remedy is a dose of pulverized charcoal, say a teacup full to a full grown cow, and a dose of corresponding size for other animals, according to their weight. The charcoal is best if fresh, or if kept corked air-tight in bottles. It should be mixed well with water, and may be poured down the throat from a junk bottle. Fresh burning coals from any wood fire, pulverized at once in a

mortar, will make a good material, but the article usually sold and made in coal pits, is too hard, and generally too old to be good.

Orchards.—Newly set orchards should have the soil well cultivated or mellowed about the trees, and kept perfectly clear from grass and weeds. On the approach of hot and dry weather, a wide and deep mulching of old straw or other litter will be useful. All orchards should be carefully examined for the borer, which if taken in time may be easily killed before it has gone far into the wood; even afterwards, by clearing away the powdered wood, the insect may be followed and destroyed in his hole, by a wire or flexible twig. Scraping away the earth from the foot of the trunk, and applying soft soap, will serve to repel these insects from depositing their eggs, but is not always infallible.

There are a few other operations that should not be forgotten in time. Destroy caterpillars in orchards; whitewash fences and buildings; on rainy days get harvest tools all ready; provide hives for swarming bees.

Work for July.

Continue to cultivate well, till arrested by the labors of haying and harvesting. Continue the war against weeds; "a stitch in time will save" thousands. See work for last month.

Haying.—The best time to cut hay is at the transition from flower to seed. The precise point, of course. cannot be generally attained in ordinary practice, where many days are required for securing a crop, but the nearer we come to it the better. The expedition accomplished by means of mowing machines, horse rakes and horse forks have, however, greatly facilitated this object. Cutting grass early produces more readily a good after growth. If done too soon, it will lack substance; if too late, it will be hard and woody. Celerity of operations depends much on good management, and on having every thing in full readiness. The omission of some requisite will delay the whole, and a day's delay, by throwing the mass of the work into a rain storm, may result in heavy loss.

Stacking in the open field cannot be recommended. Ample barns should always be provided. Yet temporary necessity may often require stacking. When resorted to, it should be done well; the stacks built even and with symmetrical form; the hay should be pitched on from different sides to preserve upright and even settling; for when a stack settles to one side, it necessarily exposes the upper side to rain, and often to the loss of a large portion of the stack.

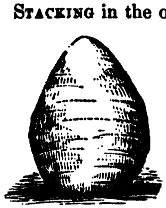


Fig. 26.

Evenly built Stack—the horizontal lines showing the rounded surface of the layers.

Fig. 27.

Unevenly built stack—the horizontal lines showing the uneven settling of the layers.

Fig. 28. PALMER'S FORK. Fig. 29.

Good stackers repeatedly and regularly pass around the structure, and place the hay in uniform forkfuls in regular and circular layers. The centre is always rounded the highest. In a well built stack the fibres at the outside falling downwards prevent any rains from passing in but a few inches; one laid up badly may allow the water to enter a foot or more. The sprinkling of a peck to a half bushel of salt through each ton of hay assists in preserving it, and renders it more palatable.

HORSE FORKS.—On page 298 of Vol. II, RURAL AFFAIRS, is given a description of Gladding's Horse Fork, and directions for using Horse Forks in general. It should have been stated that a board facing for the mow or stack, three or four feet wide, should be placed against it for the loaded fork to slide up in contact with. Several other Horse Forks have since been invented, some of which are represented in the accompanying figures. One represents Palmer's Fork, (figs. 28 and 29,) the right hand figure showing its position when ascending, loaded with hay; the left hand figure, with the knee-joint brace contracted by jerking the cord and emptying the load. Fig. 30 is a Fork similar in principle, called the "Ne Plus Ultra."

Fig. 30.—Ne Plus Ultra Fork.

Myers' Hay Elevator, (figs. 31 and 32, at head of next page,) is shown in fig. 31, in its position when lifting the hay, and fig. 32 when dropping it. It

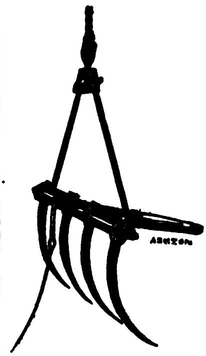


Fig. 31. MYERS' HAY ELEVATOR. Fig. 32.

is made by Remingtons & Co., of Ilion, the head of iron, and is a strong and simple fork.

Fig. 33 is Beardsley's Hay Elevator, and the figure sufficiently explains itself.

In selecting the best mowing machine, it is very important to procure one not liable to breakages: for a break may delay all hands, retard the work before approaching rains, and occasion a loss ten times as great as the mere cost of repairs. The best machines effect a great saving, and will cut regularly from 8 to 12 acres per day—or in good grass from 16 to 25 tons daily.

Where every facility is provided in connection with the best modern machinery for hay making, including horse rakes and horse forks, hay can be manufactured for 50 cents a ton—with bad or imperfect management it may amount to $2 or $3 per ton.

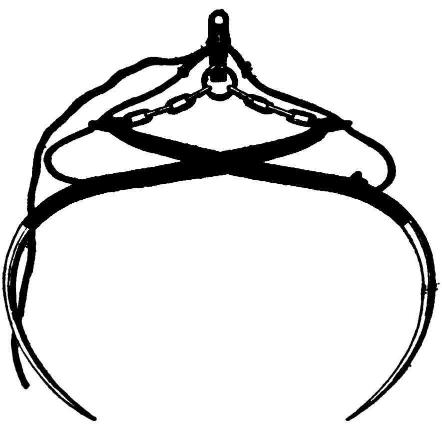


Fig. 33.—BEARDSLEY'S HAY ELEVATOR.

HAY CAPS.—In regions of the country liable to sudden storms, and in proximity to cities when hay commands a high price, hay caps (fig. 34) are important and valuable, frequently saving much labor, and preserving the quality of the hay. After a little practice in use they may be applied in less time than is commonly required for trimming the cocks. The following

Fig. 34.—Hay Cap.

directions for making them are given by H. F. French:—"Take four yards of yard wide cotton sheeting; sew it together so as to make two yards square; hem the rough edges; turn up each corner two or three inches, and sew it strongly; tie in a short strong twine to form a loop, and you have a hay cap ready for use. Four sharp wooden pins, of hard wood, half an inch in diameter, 18 inches long, to be thrust upwards through the loops into the hay at the bottom of the cock, completes the preparation."

Wheat.—Cut this as nearly as practicable about one week before it is usually dead ripe. Careful experiments show that the grain is heaviest and makes the best flour while a portion, say about one-third, of the chaff is yet green, or with green streaks running through it, and the straw is brighter and richer. The same crop will of course vary some, and the time cannot always be controled to a day, but the above rule should be aimed at. It is always worth paying something for insurance, and the extra labor required for putting up good, well capped shocks, in which the grain may stand until thoroughly dry, is a very profitable premium to pay. Seven sheaves form a good size—the caps should be bound very tightly near the buts, and the straw broken down all round before placing it. Practice will enable a hand to shock very rapidly. Hay caps, made of cotton, form an excellent covering for wheat, when they can be had.

Fig. 35.—Mode of making Wheat Shocks.

It is necessary, in every grain field, to cut certain portions by hand; for this purpose one of the best implements is Flanders' Grain Cradle, (fig. 36,) which is easily adjusted by screws and wires.

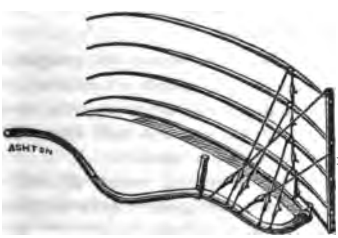


Fig. 36.—Flanders' Grain Cradle.

Timothy Seed.—Select the best portions of timothy meadows for seed, pulling out any weeds or foul stuff which may be found in it.

Sow Buckwheat during the present month. The ground should have been previously well prepared for it, and rendered clean and mellow. The failure of this crop is often owing to the imperfect manner in which it is put in.

Cheese Making.—For full instructions, under this head, see Rural Affairs, Vol. III, pp. 229 and 259.

Cutting Timber.—The best season for cutting timber has caused much discussion; but full experiments have shown that it always lasts longest when most rapidly seasoned; this is more especially the case with all the soft and less durable kinds of timber. Basswood rails cut and split at midsummer,

with the bark immediately peeled from the wood, will dry rapidly, and become durable and hard, like horn; cut in winter or spring, it dries very slowly, generally becomes sap-rotten, and is of little value.

ORCHARDS.—These, if young, should be kept well cultivated throughout summer, either in low, hoed crops, or in mellow soil without crops. This treatment is most important for peach trees, which will grow at least ten times as fast as when their cultivation is neglected; apples three or four times as fast. Newly set cherry trees often die during the heat of midsummer, which is easily prevented by a wide and thick mulching placed around them. Watering young trees, at this time, usually does more harm than good, by merely crusting the surface without moistening the roots, and at best affording but an irregular and temporary supply. If the surface of the soil is kept mellow, it will preserve moisture enough in the earth, and the rapid growth of the tree will render watering unnecessary. The black-knot, which so often disfigures and destroys plum trees, may be kept off by watching and constantly cutting it away on its first appearance.

WEEDS.—The busy labors of this month are apt to cause a neglect of weeds; and farmers who have kept their hoed crops clean until now, frequently neglect them, and they become foul. One of the most economical of all expenditures would be that of a little more labor in destroying these weeds, so that they may not seed the whole land for another year.

Work for August.

HARVESTING.—In the far North, where this work is not yet completed, refer to the directions of last month. Oats in many places yet remain to be cut. This should be done while the straw is yet slightly green—the straw will be more valuable, and the grain not shell out as when fully ripe. The gleanings of all grain fields may be secured with a horse rake.

STUBBLE GROUND.—To destroy the seeds of weeds, harrow all stubble ground as soon as the harvest has been secured, or pigs have eaten the gleanings—the first rain will then cause all seeds to germinate, and the next plowing will turn under the green crop as manure.

HARVEST TOOLS.—These are often neglected, and suffered to remain weeks exposed to the weather, to their serious injury, by the rusting of metal and the decay of wood. Let them all be carefully housed, after having been thoroughly cleaned, and the bright metal parts rubbed slightly with lard, oil or melted grafting wax.

SEED WHEAT.—In order to keep up the highest quality, or to improve the seed of wheat, select the very best portions of the field, and exclude the seeds of every weed, and especially of that notorious intruder, chess. Many careful farmers, by continued attention for years, have succeeded in entirely eradicating chess from their farms. To improve the quality of seed wheat, the largest and finest heads may be selected by hand; the process repeated, year after year, will give very encouraging results. A half day spent in

thus selecting the best heads will furnish a considerable amount, and all weeds may be thus kept out. The best winnowing machines may also be used for this purpose, separating the largest, best and earliest ripening grains from the rest.

Weeds.--This is the season of the year when many weeds ripen and scatter their seeds. A day's work now, properly applied, may therefore save a half dozen days' labor another season. Clear all the weeds out of corn and potato fields, root crops and gardens. Briers cut during this month will be severely checked in growth, and sometimes destroyed. Plow in deeply the ox-eye daisy; dig up all scattered plants which appear before winter, and follow next year with a hoed crop.

Draining.—On lands which were too wet to underdrain last spring, the work may be now done to advantage. Muck swamps, which may be reclaimed and brought into cultivation, or which may afford muck for compost heaps, should now be thoroughly underdrained. The muck for manure should be thrown out and formed into large, well shaped heaps, and they will become dry in the course of a few months. To prevent rains from soaking these heaps, they may be neatly covered with boards or thatch, or if even made with a smooth sloping top, beaten hard with a spade, much of the rain will be thrown off from the surface. The disappointment which many meet with in the use of muck with manure, is owing to the amount of water which it already contains, preventing the absorption of the liquid parts of the manure. Wet muck is usually about nine-tenths water; and if rendered perfectly dry, will therefore absorb about nine times its own weight of liquid manure; hence the importance of using it in yards or manure heaps as dry as possible.

Manuring Wheat.—In most of our best wheat regions, unless the soil is already quite rich, the most effective use of manure is as a top-dressing after the land is plowed. It has often increased the crop 8 or 10 bushels per acre, and sometimes given a good yield of the Mediterranean variety where the winter has nearly destroyed undressed fields. The manure for this purpose should be fine or well rotted and well broken by harrowing. To prevent the manure wagons from hardening the plowed soil, it is a good way to plow and then dress a strip on the further side of the field, and then repeat the process on successive strips till the whole is completed. If the soil is very dry, bring the moist portions up by deep plowing, and drill in immediately.

Stacks and Straw.—Every farmer, where practicable, should provide barn room for all his hay and straw; but where stacks become necessary, much may be done for securing their contents in good condition by retopping them. A load of straw neatly placed upon the top of a large hay-stack, and neatly raked downwards, or what is better, a thatched top, would be of great benefit.

Farmers who have ample barn room, with their grain safe from rats, and who are not compellèd to hurry it early into market, will do best to leave

their thrashing until winter. A small machine, driven by a two-horse endless chain power will enable them to go through the work at that time with little or no additional help for attendance. The straw being fresh will be preferred by animals. Where, however, thrashing is done now, care should be taken to secure straw in good stacks, protected from the weather. Good, well preserved straw will assist much in wintering animals, and if fed in connection with a small portion of grain or meal, may bring them through in good condition, more cheaply than if fed on hay alone. The daily use of a portion of straw as litter will help towards the manufacture of a large amount of manure. The straw should therefore be placed where it is easily accessible at all times. The stacks or ricks should therefore be as carefully built as stacks for hay.

Fattening Animals.—Feeding these should be commenced early in the season—the same amount of food will go much farther now than in cold weather. Late summer apples may be fed to swine. Select and purchase all needed stock.

Meadows.—These should be now cleaned of all bushes, rocks, stones, and other rubbish which may interfere with the mowing machine another season.

Lightning Rods.—Where not already erected, farmers may put up their own rods, according to the directions given in Rural Affairs, Vol. III, pp. 181, 270.

Fences and Stone Walls.—Farms which have loose stones, or quarries, may be furnished with the best of all barriers, in the shape of good stone walls. A few weeks spent each year will after a time furnish the farm. The great leading requisite, to prevent the frost from ultimately throwing them over, is to set them in trenches. These trenches should be as wide as the bottom of the wall, and deep enough to be below frost—say from a foot to a foot and a half. These trenches may be filled with such small stones as cannot be used in the wall; large ones will not answer. The trenches should never become filled with water. Walls built upon the surface of the ground, no matter how well built and perfect the blocks may be, will soon become distorted by heaving, and be ultimately overthrown by frost. Where the stone are not good for building, the wall may be bound together by strong cross-ties of durable wood, placed about half way up, or at two or three different distances up—cut the right length with a saw, and split thin, and two or three inches wide. In such cases, or where stone is not abundant, half wall may be built, capped with two rails, supported by stakes.

Saving Timothy Seed.—The great point is to have a good, clean crop. The best portion of the meadow should be selected, and all foul weeds previously well cleaned by hand. It is usually cut too late, or when the seed shells. The best time is when most of the heads have become brown. It is unimportant how it is cut, provided it is taken in before the seed wastes, and is not allowed to heat or mold. It may be cradled at some height, the rest being afterwards cut with a mowing machine; or it may be cut with a

hand scythe—narrow swaths and a little practice enabling the workman to throw the heads all one way. It will usually be dry enough to bind in a day or two.

Work for September.

Sowing Wheat.—The preparation of ground for wheat is an important labor for this month. The ground should be made mellow, that the moisture may be preserved and the seed vegetate freely. It should be clear from weeds and their seeds, that the crop may not be choked, the product rendered foul or impure, nor the subsequent grass crop diminished in value. Experience only will teach the farmer the proper degree of fertility—there are very few farms, however, where the addition of fine manure will not be advantageous. An excellent mode of managing is the top-dressing given in the directions for last month. This top-dressing also assists the germination of grass seed, thus affording the advantages of thick seeding and insuring a vigorous growth of the plants. Timothy seed sown with the wheat, or immediately after, usually produces too strong a growth, and lessens the wheat crop, as well as interferes with the harvesting; it is best, therefore, to sow it about a fortnight afterwards, and the clover as early as possible the following spring. This top-dressing also protects the surface of heavy soils, and lessens the tendency to freeze out. Sowing wheat early produces stronger plants and a better crop, but does not cause earlier ripening of the grain. The drill seeding, if properly performed, gives the best crop, often from three to five bushels more per acre—but much drill seeding is improperly performed, the seeds being deposited too deep—an inch and a half on heavy soils, and two inches on light ones, are better than any greater depth; if the soil is moist enough, a less depth is better. Any farmer may satisfy himself on this point, and gain valuable practical information, by a few measured experiments. Some, who have set their drills much too deep, have had lighter crops than with ordinary broadcast sowing, and have hastily denounced all machines of the kind.

Seed wheat that is infected with smut may be purified by washing in brine and then sprinkling and stirring in powdered slaked lime.

Seed Corn.—Improved varieties always tend to run backwards; the farmer should therefore constantly select the best ears for seed; this should be a regular yearly business, and if faithfully carried out, will give an increase of several bushels per acre, in the long run.

Swine.—The falling apples in orchards may be now fed to swine, and in connection with richer and drier food, will cause them to fatten rapidly. Winter apple trees are often allowed to over bear, and the removal of a portion of the crop for feeding these animals, will improve the remainder. No tree should ever bear heavy enough to need propping. The yards and apartments in which swine are kept, should be scrupulously clean, and rendered comfortable by dry litter. Experiments have shown that they fatten faster

under these circumstances. Great pains should be taken to feed them with clock-work regularity, and not to give so much at a time that some will be left, and a distaste for food produced; neither should they ever be allowed to squeal off their flesh by waiting impatiently.

BUTTER.—This is usually the best month for the manufacture of butter; the great leading requisites for success in which, are, first and most important, good, sweet, rich, abundant pasture; secondly, good cows; thirdly, perfect cleanliness in the dairy house, in all the vessels used in it, and in the air which surrounds it; fourthly, general and skillful management throughout. Under the latter head may be mentioned, shallow pans or shallow milk in the pans, proper temperature of the cream, and working out all the butter-milk. See the full directions in RURAL AFFAIRS, Vol. III, p. 257.

TOP-DRESSING MEADOWS.—The best mode of manuring meadows is thoroughly enriching the soil by manure, applied to the crops which precede laying down. But scarcely inferior, and perhaps equal to this treatment, on clayey soils, is autumn top-dressing. The manure for this purpose should be broken fine, and very evenly spread. Harrowing, some weeks after the application of the manure, will often be useful where the grass is short. The manure, thus applied, causes a strong autumn growth, enriches the surface soil by the washing in of autumn rains, and both the manure and the increase of grass protect the roots during winter, and give an early growth in spring.

GENERAL HINTS.—There are a large number of farm operations which should not be forgotten during the present month. The erection of suitable buildings for sheltering domestic animals the coming winter, is a very important one; drain bogs when dry enough; clean meadows of all scattered stones and rubbish; see that root crops are kept clear of weeds; examine and repair all fences; soil and feed cows if the pastures are short; grub up bushes and briers; cut up straggling thistles in pastures; pull up scattered mulleins by roadsides; harvest buckwheat as soon as it ripens; clean and ventilate cellars on rainy days. Attend agricultural exhibitions and acquire all the new and valuable hints which such opportunities afford.

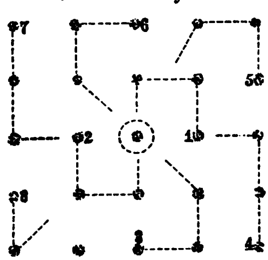


Fig. 37.—Mode of Cutting Corn by hand, 25 hills to each Shock.

CUTTING UP CORN.—Much labor is saved, by taking no unnecessary steps; this is the reason that some men accomplish more than others with equal exertion. The remark applies particularly to cutting up corn—where a regular system will save many steps. If the corn is of a large variety, or in large hills, twenty-five hills will make one shock, (fig. 37,) and the inexperienced workman may take three hills at a time, each successive three being designated

by figures in the accompanying cut, the dotted lines connecting the three. Smaller varieties of corn, in smaller hills, will enable the expert laborer to take six hills at a time, and to form a large shock of 49 hills, (fig. 38;) commencing at *a*, he takes the first three as a beginning; next at *b*, he takes six; at *c*, the next six, and so on, the dotted lines showing his footsteps. A larger armfull may be taken by placing the arm above and before the hill, instead of behind it.

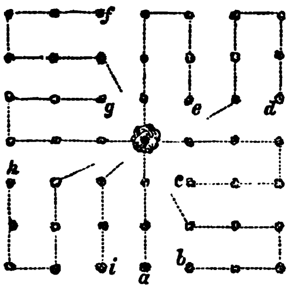


Fig. 38.—Mode of Cutting up Corn, forming a Shock of 49 hills.

The common mode in cutting is to place the shock around a central uncut hill, which occasions some inconvenience in husking, to obviate which the corn horse is used. It consists of a pole about 12 feet in length, and nearly as large as a common wagon tongue. One mode of constructing it, (shown in fig. 39,) is by placing the legs at the end of the pole, the other end resting on the ground. Two or three feet back of the legs a horizontal hole is bored, admitting loosely a rod four or five feet long. The corn when cut is placed in the four corners made by the rod and pole, and when the shock is finished, the rod is pulled out and the pole drawn backward. In fig. 40 the same end is accomplished, only the pole is drawn forward instead of backward.

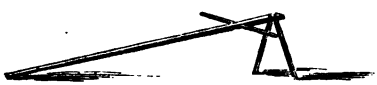


Fig. 39.—Corn Horse, used in constructing Shocks.


Fig. 40.

Stone Walls.—At the present season, between harvesting and the securing of autumn crops, it is a good time to draw stone, and construct stone walls or fences. The durability of a wall depends greatly on the manner in which it is built. Two new walls of the same height and general appearance, present a perfect contrast after the lapse of twenty or thirty years. There are a few now standing after a lapse of over half a century, as straight and perfect as the year when they were built; but there are a hundred times as many not nearly so old, that are twisted, distorted, tumbling or prostrate, many of them a mere confused line of stone, variously intermingled with elder, nettle, and blackberry bushes. This contrast is owing solely to the mode in which the walls were built. The best mode should be therefore well understood. The most important of all requisites is to build the wall in a trench, dug to a depth corresponding to the depth to which the soil freezes. This trench should then be compactly filled with small rounded stone, broken stone, or with coarse clean gravel, according to circumstances, or supplies at hand. If

the soil is compact, this trench should have a drainage, or outlet. On these small stone the wall is erected. It often happens that an under drain, three feet deep, filled to the surface with small stone, may serve as a good foundation for the wall; but unless the soil is tenacious, and especially if inclining to the nature of quicksand, it will be liable to work into the ditch at the sides and towards the top, unless well shielded with a lining of flat stones or of gravel. A wall with such a base as this will remain unmoved by frost for ages; while one placed merely on the surface will rise and fall at every freezing and thawing, the stones will become gradually displaced, and before many years will totter and fall.

The best stone are such as are flat or in square blocks. But a substantial wall may be made of round or cobble stones, if they are solidly laid and crossed ties of wood are employed. The lower series of these ties should be near the bottom, or about a foot high; the second, two-thirds of the way to top; or, if the stone are nearly round, three or four may be placed at different heights. They

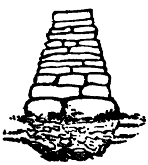


Fig. 41.—Cross Section of Well Built Wall.

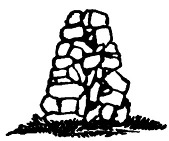


Fig. 42.—Cross Section of Badly Built Wall.

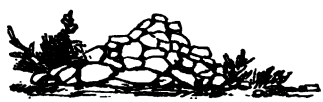


Fig. 43.—Condition of Badly Built Wall after twenty years.

are all sawed of distinct lengths for this purpose, and should be split so as to be about half an inch thick, and two or three inches wide. If made of durable wood they will last an age, as they are less exposed than fence rails, being covered by the stone and nearly always dry.

Breaking Joints.—This is of great importance in laying up the wall. If well attended to, it makes it inconceivably stronger. The accompanying figures, (44 and 45,) clearly explain themselves, and show the difference

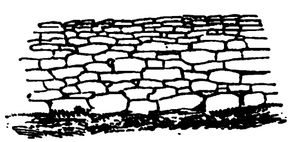


Fig. 44.—Side View of Wall well laid, or with Joints Broken.

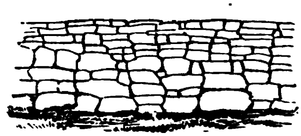


Fig. 45.—Side View of Wall badly laid, or with Joints not Broken.

between breaking the joints and the improper forming of vertical seams, presenting many chances for the wall to fall apart.

After the wall is built, the earth should be raised in a moderate slope, about half a foot against the sides, to throw off water, and as an additional protection to the foundation against frost.

Where stone are good and abundant, the wall may be built four and a half feet high, and will serve as a complete fence. In other cases, a half wall will be found most convenient, being built two and a half to three feet high, and finished by first laying a rail on the top, then crossing stakes, and finally a rider. Sometimes posts are set in the wall for receiving these two top rails; they present a neater appearance, but are apt to crowd the stones apart, and throw the wall down. A good stone wall is the most perfect of all farm fences, and well built of large block stones will last for ages without repair; the cost depends much upon circumstances. Half wall has sometimes been built for fifty cents per rod, but this is too cheap, and the work cannot be well done, nor a trench made; digging the trench, filling it with stone, and building a good half wall will cost about one dollar per rod, and sometimes more. A good wall, four and a half feet high, will usually cost two to three dollars; while others, built of large block stone, handsomely faced on both sides, and substantial enough to last a thousand years, have cost from five to six dollars per rod.

Fig. 46.—End view of half wall, on trench.

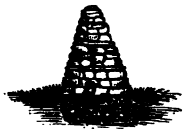


Fig. 47.—End view of wall with wooden cross-ties.

Work for October.

Harvesting Buckwheat.—Some judgment is needed in selecting the best time, as the grains ripen successively. When cut, which should be while the dew is on, to prevent shelling, it should be placed immediately in stooks, where it will cure better than to lie in the swath, and not be in danger of becoming soiled. The stooks should be rather large, so as to stand well. A small band should be placed around the top. Thus secured, the straw dries safely and readily.

Husking Corn.—All the different husking machines have so far amounted to nothing, for the reason that nearly as much time is required to break the unhusked ear from the stalk as to break it out of the husks. Farmers must therefore, for the present, depend on hand husking. Some huskers will work three times as fast as others, chiefly by having every thing close at hand. While an awkward laborer is picking up a stalk, pulling off the husk and ear, and then turning around to lay the stalk in a pile, a skillful workman will have husked half a dozen ears. The following directions, by S. E. Todd, will assist the novice:

"After the stook has been pulled down, place the basket at the butt of the stalks, a little inclined towards the husker. Procure a little box for a seat, about ten inches high. If a husker is not discommoded by resting on his knees, a low seat may be dispensed with. Let the husker place himself close to the corn, so that it will not be necessary to reach far for each stalk. Now take an ear in the left hand, and with the husker or fid on the right

hand, pull down half the husks. As the right hand goes down, let the left hand rise to the tip of the ear, and slip the thumb of the left hand over the end of the ear, taking off cleanly all the silk, and bring it down with the other half of the husks. Two quick motions of the hand will husk an ear neatly. As the left hand grasps the stem, preparatory to breaking off the ear, let the husks be retained in the hand, so as to protect it from becoming tender between the thumb and forefinger, where every ear of corn strikes it, as it is separated from the stem."

The workman will of course husk a large number of stalks, until he has an armful, or rather lapful, before stopping to remove them. As it is a saving of labor to avoid rehandling the corn, the assorting should be done at the same time, by providing two baskets, one for the poor and the other for the good corn.

Potatoes.—A time should be chosen for digging these, when the soil is dry, as freedom from rotting depends greatly on having them packed away clean. If the cellar is moist, the bins for receiving them should have a grated bottom, to admit ventilation. If dry weather cannot be selected for digging them, it is best to deposit them, and spread them out for a few days upon a barn floor; during rainy weather they may be assorted, and when placed in the cellar will be less liable to rot than if taken there while wet and muddy. When potatoes are placed in out-door heaps for wintering, it is important to place a straw wisp ventilator at the top, where the accumulation of foul air will otherwise cause decay. But the best way is to place the potatoes in large heaps, and cover them at least a foot thick with straw—a few inches of earth applied towards winter, and beaten smooth with a spade, will be a sufficient covering, (fig. 48.) Potatoes kept in this way are not subjected to the evils of confined air and moisture, so common with a few inches of straw and a foot of earth—and after many years' experience, the loss has not been more than one per cent. from ordinary decay.

Fig. 48.—Mode of Burying Potatoes in Open Ground.

Winter Apples.—These should be all carefully hand picked to prevent bruising. Light ladders should be provided, and care taken not to bruise any portion of the tree. Baskets, provided with hooks for hanging on the limbs, is a common and good way, but a better and more expeditious one is to take a common clean grain bag and place a stick, sharpened at each end and about a foot long, so as to prop the mouth open, leaving a triangular opening, ready for the reception of apples as fast as picked by both hands.

Tie the upper and lower corner together, by placing a pebble in the lower corner, so as to form a sort of button, and then tying the bag strings closely above it. The bag is then slung over the shoulder, as shown in fig. 49. A piece of stiff leather buttoned on the shoulder serves to protect it

Fig. 49.

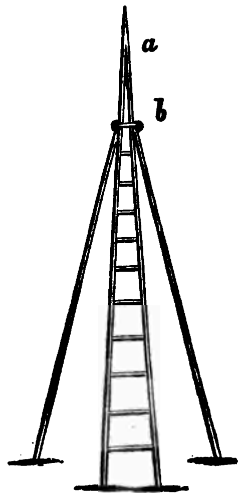


Fig. 50.

from the weight of the bag. Portions of the tree which cannot be reached with an ordinary ladder, may be gathered by the standing ladder, (fig. 50.) Fruit on the ends of long and tall branches may be gathered by means of the fruit picker, shown in the annexed figure, (51.) It consists of a piece of stiff wire about two feet long, beat into the form shown at *a;* the two ends are then thrust through gimlet holes in the end of a pole; a small bag, large enough to hold half a dozen apples, is then sewed to the wire. This completes the instrument. The narrow part of the wire assists in removing the stem from the branch. A picker of this kind is especially valuable in gathering any high priced fruit, such as pears, which would otherwise be bruised and spoiled. As some fruit, such as the autumn varieties, must necessarily fall, the ground of

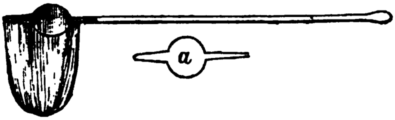


Fig. 51.—Fruit Picker.

orchards, or beneath trees, should always be kept smooth, and as free from stones as possible.

VINEGAR may be made from cider by adding two quarts of molasses to each barael of cider, and exposing it to warmth, sunshine and air.

NEW CORN may be prepared for early grinding by suspending it in a coarse bag near the ceiling of any warm room where a fire is kept.

PLANTING NEW ORCHARDS.—The ground should be well prepared beforehand for new orchards, whether the trees are set out autumn or spring. Unless the soil is already quite rich enough, its fertility should be increased by manure previously applied, or to previous crops; or it may be enriched after the trees are set out, by autumn top-dressing for working under in spring. The soil should also be well drained and subsoiled, or deeply plowed.

STUBBLE GROUND.—All stubble ground should be well harrowed to start the weeds, which may be turned under either the present autumn or next spring.

PAINTING BUILDINGS.—This is the best season of the year for out-door painting, when the hot sun will not dry the paint to powder, but it will form a hard, durable coat.

FATTENING ANIMALS.—The feeding of all domestic animals for fattening should be carefully and regularly continued during the present month. Regularity as to time is of great importance—the animal's appetite is an accurate chronometer, and unusual delay is certain to result in a waste of flesh. It is important to attend to all their comforts—a great secret of success with skillful managers. Especially avoid waste, dirt and surfeit. Some of the best farmers are very careful to commence foddering cattle early, or as soon as frost affects the grass—that being regarded as the most critical period in the year, and when cattle fall away most rapidly, or contract fatal diseases.

Work for November.

During this month autumn work must be closed up, and preparation made for winter.

ROOTS.—Rutabagas and other root crops should be harvested early in the month, or one freezing night may destroy them. A special provision should be made for the preservation of rutabagas in masses to prevent their heating and spoiling. If buried out of doors they should be in a long pile, with frequent ventilating wisps of straw at the top; if stored in cellars they should be placed on a wooden grate or rack, so that the air may frequently pass under and up through them. All roots, whether turnips, beets or carrots, should be packed away clean and dry.

ANIMALS.—Keep all fattening animals comfortable, dry and warm. Feed them regularly, frequently, and in moderate quantities. Do not try to economize by giving them foul or musty food. Provide places where they can obtain pure water at pleasure, throughout the winter. Do not depend on pasture, especially after the frost has dried it, but give fodder with a small,

regular supply of meal. Many cattle are injured, and badly fitted for winter, by compelling them to live on pasture alone, late in autumn. When pumpkins are abundant, pains should be taken to keep them well and to prevent their freezing. When frozen hard like stone, or after they have thawed and become rotten, they are poor food. They may be placed in large heaps in a sheltered place, and covered with a foot of straw, till wanted, and thus secured, will give cattle a fair start into winter.

GRAIN FIELDS.—Where wheat-fields have not been top-dressed with manure, as mentioned in the September directions, a thin dressing of fine manure can be still applied. It will serve to protect against winter-killing, and make a fine rich surface for the clover seed in spring. Provide surface drains wherever they will be needed, and shovel out the loose earth, that the water may run freely.

MANURE.—All the manure which can be found on the premises, or scraped up in the yard, should be spread before winter. Applied to grass lands, whether for pasture, meadow, or for turning under to be planted with corn, it will be worth twice as much as to be applied next spring. In some cases an increase of twenty-five bushels of corn per acre has resulted from thus manuring the sod in autumn, over a spring application.

FALL PLOWING.--It will greatly assist the labors of next spring, in planting and sowing early, to do as much plowing late in autumn as practicable. In order that there may be a free drainage, the furrows should run directly up and down hill, by the shortest slope; if plowed across, the furrows will become filled, and the land soaked with water. It may be well to shovel the loose earth out of the dead furrows, for the same purpose. If the ground is wet or undrained, plow narrow lands. This treatment will enable the farmer to work his land early in spring.

SHELTER AND STABLES.—Prepare stables and sheds for winter, securing loose boards, making all necessary repairs, clearing away rubbish, and rendering the whole clean and comfortable.

GENERAL HINTS.—Save cornstalks from rain—for every farmer knows well the difference between fine, green, fresh fodder, and that which is wet, mouldy, and half rotten. Finish under-draining. Keep cellars clean and neat. Shelter all tools, and apply a thin coating of lard and rosin to such parts as might become rusted. Draw leaves from the woods for littering stables and converting to manure—nothing is better than dry leaves for bedding animals on imperfect floors, as they entirely exclude the cold currents which would pass through straw.

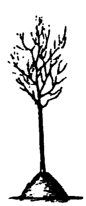


Fig. 52.—Mode of banking up trees to protect from mice.

ORCHARDS.—Transplant hardy trees—in windy places stake them against the wind. Where danger is feared from mice, all damage may be avoided by a small mound of compact earth a foot high, around each tree, beaten smooth with the spade, (fig. 52.) A mouse will never ascend a smooth bank

of bare earth under snow; and, if trees are heeled in for winter, they may be secured from mice by observing the same precaution. It often happens that trees may be procured best in autumn, where they are to be brought long distances, or where it is desirable to make the best selection from nurseries. In such cases it is often most convenient to set them out the following spring. In heeling them in, select a dry, clean, mellow piece of ground, with no grass near to invite mice; dig a wide trench, lay in the roots sloping, (fig. 53,) and cover them and half the stems with fine mellow earth; fill in carefully and solid all the interstices among the roots; doing this work imperfectly often results in loss—if well performed, it never can. If much danger is feared from mice, it is better to place the trees erect in the trench, (fig. 54,) and round up the whole surface about them; but, being more exposed in this position, they should be placed in a more sheltered situation from the winds.

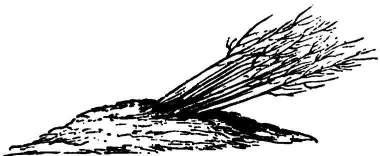


Fig. 53.

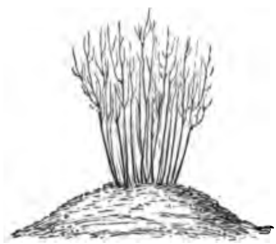


Fig. 54.

Work for December.

The labors of the season having been devoted to the raising of crops, the period for their consumption has now arrived. As it is important, on the score of economy, to raise heavy crops, so it is equally important now to study the most economical modes of feeding. 1. The first point of economy is to prevent loss by good and comfortable shelter. Exposure to freezing winds not only injures the growth and thrift of animals, but requires a greater amount of food to maintain animal heat. Sometimes the loss of animals, by death alone, towards spring, is greater than the cost of ample shelter. 2. The second is to feed regularly, that no loss of flesh may be occasioned by impatient fretting. 3. The third is, to give the food in the best condition. Hay and stalks should be bright, and not musty. Cornstalks will go much farther if cut before feeding; but they should be cut very short, or less than a quarter of an inch in length, so as to be fine like chaff; this can only be accomplished by horse power; it rarely, or never, pays to cut fodder by hand. Grain should be ground wherever practicable, for animals of whatever kind.

Straw should be carefully saved, even when raised in large quantities, as it has so many uses. It may be employed largely in feeding animals, if a little grain or meal is fed to them, regularly, at the same time. It may be

largely used as litter, and converted into manure. It forms an excellent covering for large heaps of roots in winter, whether in root cellars or more exposed. It may be employed as a cover for temporary sheds for protecting cattle and sheep. In most cases the best way to manage straw is to thrash the grain as the straw is needed through winter, by means of a two-horse endless chain power, which requires but few hands in attendance. If thrashed with a larger machine, care should be taken to save the straw from injury; if bound in bundles, as it is thrashed, it may be more readily handled. The best way to do this is to twist previously a large quantity of straw bands, which may be done by means of the hook and handle shown in the annexed figure, (55,) the operator taking the handle in his right hand, holding the wooden portion of the hook in his left, and twisting as he walks backward; the hook is easily made by bending stout wire; or the twisting may be more rapidly performed by attaching a hook to the pinion of a fanning mill. These bands, if twisted of slightly moist oat straw, will preserve their twist as soon as dry, and may be cut up into any desired length. When the thrashing is performed, place a straw band so that the straw may fall upon it, drawing it into a compact heap, and when large enough, bind it. As soon as the binding is commenced, let a second hand place another band, and proceed as the first has done. In this way two men will bind all the straw that is thrown out of the largest size machine.

Fig. 55.—Hook for Twisting Straw Bands.

VENTILATION.—This is important for all animals, horses, cattle or swine. Foul air, drawn into the lungs, cannot fail to injure its delicate coatings and destroy, more or less, the health of the animal. Many farmers have decided against stables, because of the injury from dirt and bad air. Keep them well littered at all times, and let them breathe a pure air, and a different report will be made. But another, opposite, evil must be also avoided. Cold currents of air, sweeping through cracks, are sometimes nearly as bad as open exposure, and for this reason some farmers have concluded that exposure is best, after all.

SHEEP.—Large flocks should be separated into portions of about 50 each, in separate pens in the shed, placing the stronger in one pen, the weakest in another, each portion being as nearly equal in strength and vigor as possible. Sheep always do best if fed some grain through the winter, commencing with a very small quantity at first and gradually increasing as the winter advances. Caution in beginning to feed lambs in small quantities is particularly important. An average of half a pint of corn a day is sufficient for full grown sheep—half that for lambs. A good time is to feed them grain at noon, and fodder night and morning.

COLTS AND YOUNG HORSES do well on straw, with a little grain—an excellent way is to cut oats in the sheaf an inch or two long, and feed the whole, grain and straw together.

Good Water should be provided at all times for all domestic animals, and should be supplied to them frequently and regularly, or at their pleasure. Depriving them of drink for a long time, and then allowing them to drink too much, is detrimental to the best thrift.

Manure.—The largest and best stables have a central alley passing through them, wide enough for a wagon or horse-cart to pass and carry out the daily cleanings of the stalls. Smaller stables may be cleaned by wheeling the manure out daily by hand. There are different modes of managing manure in winter—if not very strawy, it may be drawn at once and spread over the fields. On grass land thus treated it will produce a much better effect than if applied in spring, the rain soaking the soluble portions well into the soil, and among the roots; an equally good effect is produced if the sod is to be plowed for corn. No fear need be entertained of the manure washing away, except in the beds of streams, as the soil, as soon as thawed, and especially if of a loamy or clayey nature, instantly absorbs the soluble manure. If the manure is quite strawy, it should be placed in large, square piles, that it may rot down, and when the central portion is decayed, the edges should be cut down with a hay knife and thrown on the top. Manure containing little fibre, or litter, should be kept under shelter to prevent waste, but coarse and strawy manure should be exposed to rains to hasten decay. Muck, which has been shoveled out and dried last summer, may now be drawn and applied to yards and manure heaps.

Feeding Racks, to prevent the waste of fodder, should be provided for all animals, of which descriptions and figures may be found in former numbers of the Register. Stock should be regularly salted; if they have a constant supply, they will eat but little at a time.

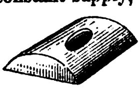


Fig. 56.—Salt Trough.

Salt Troughs, for yarded animals, are easily made by taking pieces of thick slab, say a foot long, and boring with a large auger or making a mortise nearly through on the rounded side. These holes contain the salt, and the troughs, lying on the ground, cannot be overturned.

Running out of Fodder.—Some farmers seem scarcely to know how they will be likely to come out in spring with a supply of fodder for their animals, and know of no better way than guessing. They should be more accurate, and determine by calculation early in winter what their supplies will be. If they have not kept a record of the number of tons of hay, it may be determined with considerable accuracy, by allowing five hundred cubic feet per ton of good, compactly pressed timothy, in the lower part of the stack or mow, and six to seven hundred in the upper part, or of clover. Then, allowing two and a half to three pounds daily to each hundred weight of animal, an accurate result may be nearly reached, varying in localities where the winter is long or short.

Manuring Wheat.—Where manure has not been already applied by top-dressing in autumn, either at the time or subsequent to sowing, it may be

still spread to greater advantage whenever the ground is frozen hard, so as as to bear the wagon, and taking the precaution to use such fine manure as may be thinly and evenly spread. This coating of manure will also insure and accelerate the growth of the young clover in spring.

GENERAL SUGGESTIONS.—Be careful to keep cattle and other animals from meadows and pastures when the ground is soft, that they may not spoil the turf. Pick over apples in the cellar, and remove the decayed ones. Provide good dry fuel for the kitchen. Balance accounts for the season, and observe what operations in farming have been most profitable. Get up club meetings for evening discussions of agricultural subjects. Study the success and failures of other farmers, by taking a good agricultural paper.

ROAD MAKING.

BY E. W. HERENDEEN, MACEDON, N. Y.

[Written expressly for the Illustrated Annual Register of Rural Affairs.]

The roads of a country are not only necessary to its civilization, but are certain and accurate tests as to its degree. In savage and barbarous coun-

Fig. 1.—Traveling on Good Roads.

tries there are either no roads, or those only of the simplest and most imperfect character—mere paths for the hunter to wend his way in. But the wants

Fig. 2.—Traveling on Bad Roads.

of civilization require roads for the transportation of produce to its market, and the conveyance of passengers for travel or pleasure.

It is said, by high authority, (Gillespie,) that the common roads of the United States are inferior to those of any other civilized country. Whether this remark is perfectly true or not, it is positively certain that a majority of them are miserably and needlessly poor, especially in the newer parts of the country.

If the road makers had gone to work with the intention of throwing obstructions into them, they could have hardly succeeded better. Loose stones, from 100 lbs. downwards, lie thickly scattered over their surface, destroying the wheels of the passing vehicles, and frequently seriously injuring the horses—lessening the amount which a team can draw, in many instances, fully one-half. These loose stones do every day more damage than the whole expense of removing them from the road. How the community endure this intolerable nuisance, it is difficult to imagine.

Fig. 3.—Cross-Section of Bad Road, with deep Wheel Ruts.

In the spring the most of our roads are either a canal filled with mud and water, more fit for a boat than for wagons, or else are an almost impassable quagmire, in which there is imminent danger of sinking into the lower regions. And when the water has a little subsided, and left dry ground, then ruts, innumerable and almost unfathomable, fill the road, its entire length and breadth. The cobble stones drawn in previous years are eagerly sought out by the exploring wheels, over which they go creaking and crashing, like a ship in a storm.

Our people are generally sharp for a bargain, and mean to get the value of the money they spend, and do not often stand at the expense of any undertaking if they think it will PAY. How this most important subject of road-making should come to be utterly neglected, is one of the mysteries difficult to understand, and two things are very evident:—1st. There is a great lack of appreciation of the value, in an economical point of view, of good roads;

Fig. 4.—Cross-Section of Good Hard Road.

and, 2d. There is a great want of proper knowledge in regard to their laying out and construction.

The office of "pathmaster," (road overseer,) is often taken in rotation by the different inhabitants of the district, and in consequence there is no system or intelligent use of the means at hand for their improvement.

Before we can expect to have good roads, the people must be convinced

that good ones are cheaper than poor. If this idea was thoroughly understood and believed, it would go far towards effecting the desired change.

The most complete series of experiments upon the friction of vehicles has been recently made in France, by M. MORIN. Some of the most important results are here given in tabular form. The fractions express the relation of the force of draught to the total load, vehicles included. It will be noticed that carts draw easier, in all instances, than four wheeled wagons, and that the friction is increased by greater velocity, as would naturally be supposed:

CHARACTER OF ROAD.	CHARACTER OF VEHICLE.					
	Carts.	Trucks of 2½ tons.	Diligences of 5 tons.		Carriages with seats on springs.	
New Road, covered with Gravel 5 in. thick,	1-12	1-9	1-8		1-8	
Solid Causeway of Earth, covered with Gravel, 1½ in. thick,	1-16	1-11	1-10		1-10	
Causeway of Earth, in good condition,	1-41	1-29	1-26		1-26	
Oaken Platform,	1-70	1-46	1-41		1-42	
Broken Stone Road:			Walk	Trot	Walk	Trot
Very Dry and Smooth,	1-75	1-54	1-48	1-41	1-49	1-42
Moist or Dusty,	1-58	1-38	1-34	1-27	1-34	1-27
With Ruts and Mud,	1-33	1-24	1-21	1-18	1-22	1-19
Deep Ruts and Mud,	1-19	1-14	1-12	1-10	1-12	1-10
Pavement—Dry,	1-90	1-65	1-57	1-38	1-59	1-39
Muddy,	1-69	1-50	1-44	1-33	1-45	1-34

The least draught in the above table is on the pavement, where in the case of the cart one-ninetieth of the weight is enough to draw the load. The greatest power required is on the new road covered with gravel five inches thick, when the same cart requires one-twelfth of the weight of load to draw it, or between seven and eight times as much.

It is a subject of regret that the table did not have one more column, to represent the force necessary to draw a load upon our muddy roads in the spring. The instance of mud and deep ruts given is on a broken stone road, which is no comparison to those in question.

It will be noticed in the above table how rapidly the resistance is increased by imperfection in the character of the road itself—even on the best formed ones it rapidly increases from three to five or six fold—diminishing its value for commercial purposes in the same proportion. There is no doubt but that our roads require, even in dry weather, twice as much power to draw loads upon them as would be necessary if they were put into a good condition by gravel, properly applied to a well formed road-bed.

It is a very easy matter to estimate the cost of a good road, and then by counting the average number of teams passing per day, make a fair estimate

of how much might be saved by a better one, not only in amount drawn per load, but in the less wear and tear of wagons, harness and horses. It will almost always be found that the loss to the community by poor roads is at least four times the interest on the cost of putting them into good condition. It will be understood that the amount of expense to be applied will vary with different localities—certain public thoroughfares needing far more expense than those leading into them.

Good roads improve the value of farms by which they run, often as much as $10 or $15 per acre; for where produce can be drawn to market for one-half the expense that is required on other roads, the land becomes more valuable in consequence.

The saving in time and wear of carriages when traveling for business or pleasure becomes a very appreciable item of expense.

Now if it were NECESSARY that our highways should be as poor as they are now in most parts of the country, it would be our duty to patiently submit to the inconvenience; but when we consider that we do not use one-half of the expense we could profitably, and the half which is used is fully one-half wasted by being improperly applied, "patience ceases to be a virtue," and it is time to listen to the grumbling tones of our carriages as they go pounding over ruts and stones, and the hopeless looks of our poor worn out horses as they wearily drag their intolerable burdens over rocks and ruts, and sloughs, miscalled a road.

Many people love to ride in good carriages, costing from $150 to $400. Dr. Johnson exclaimed, after one of these delightful rides, "that life had no greater pleasure than being whirled over a good road in a post chaise." But a good carriage on a poor road is almost as much out of place as it would be drawing stones or manure, and Dr. Johnson would, we are sure, reverse his decision, and say that life has no greater misery than being dragged solemnly along 10 or 15 miles through—not over—our bottomless apologies for roads.

The rule in making roads should be, not HOW LITTLE can be done and have the public and road commissioners endure it, but HOW MUCH can be done upon them and render the work laid out a profitable investment to the public.

Before going into the subject of road making itself, let us enter an earnest remonstrance against the common way of appointing overseers. The usual plan is by rotation, in which the experience gained in a season by the overseer is lost—for some one equally as inexperienced as himself is appointed the next year, who undoes a considerable portion of what was done the year before, and proceeds with the work without proper examination or knowledge. The truth is, road making is treated with studied neglect by the public. The following, we think, would be a great improvement upon the common method. Let the inhabitants of the district meet and fully discuss how good the road in their district should be. Let them carefully examine how much they lose each year by the poor roads they are using, and fix upon

a standard which they mean their roads shall come up to. Let various propositions be offered in regard to the manner certain portions shall be repaired. Then let them unite upon the appointment of the most intelligent, energetic and capable man in the district for five years, and give him full power to increase the tax to any prescribed amount, if in his judgment the wants of the district require it. After receiving the appointment in this manner, he would feel the importance of giving the subject his careful attention. The road would be well examined, works on road making would be consulted, and he would fix very nearly upon the best manner of repairing and building it. His interest would increase from year to year. He would feel a sort of personal responsibility in the matter. The inhabitants themselves would look at the subject with new and larger views, and would work more cheerfully and earnestly in repairing the roads, and the effect, no doubt, would be rapidly seen in their improved condition. Errors committed this year would be abandoned next, and the subject would be one of regular and systematic business.

All this could be done without any change in our laws. If this were a proper place, we would like to discuss the value of the laws themselves, and suggest some which we think would be superior. We will simply observe, that we consider the whole idea of working out the road tax wrong. The law should prescribe some fixed standard as to the character of the roads themselves, and then the work should be let out by contract, to parties under good bonds, the work to be accepted by properly appointed commissioners before receiving their pay. Skillful men would apply for the work, who would do with the same number of days' work nearly or quite twice as much as is now done; the public would be justly served, for the contractors must fulfil their contracts, or the commissioners would not accept and pay them.

This is the way all public works are carried on, and some modification of this undoubtedly would be the proper way of making and repairing roads.

But we cannot pursue, at this time, this part of the subject farther, but would earnestly urge upon every one to take the subject of their improvement into his serious consideration, and endeavor to awaken an interest in his neighborhood and district; for unless we take a deep interest, our roads will remain, as many of them are now, a disgrace and nuisance.

THE TWO GREAT IDEAS OF A GOOD SERVICEABLE HIGHWAY ARE HARDNESS AND SMOOTHNESS.

In districts which are populous, roads of broken stone will be found to be the most economical—a description of the best manner of making which will be found toward the close of this article—but in large portions of our country they are far too expensive for general introduction.

How best, with the means at hand, to improve them, is the question, without incurring any more expense than would be good economy?

1st. How best to insure the hardness of a road. Water is a great softener of the earth. The freezing of the ground in winter expands it. When this

thaws, with rain and with snow, the water fills the loosened earth, and what was often the hardest ground before, becomes soft and apparently without any bottom.

It takes weeks of weary waiting before the roads "will settle," before the water is evaporated by the sun, so as to leave the ground in a passable condition. If an UNDER-DRAIN were placed in the middle of the road, running lengthwise along it, and discharging at convenient places, it would in two or three days carry off this water and leave the ground dry and hard. Every one who has watched the action of tile drains, knows how completely and effectually they remove the water from the ground.

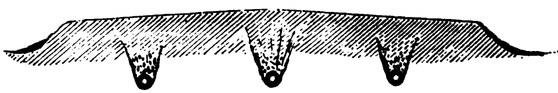


Fig. 5.—Cross Section of Road, with three Pipe Under-drains, covered with Gravel.

Unless the water is removed, the road must be bridged, (i. e. covered with some hard substance,) in some way, if it be made HARD in the spring, and if the bridging be made with gravel, it must be made thick or it will speedily cut through, when there is no hardness to support it underneath.

The whole expense of laying two inch tile drains will not exceed fifty cents per rod, including cost of tiles and drawing them, if within a reasonable distance.

This one improvement would have more beneficial effect upon the condition of the roads than four times the expense applied in any other manner whatever. In fact, if this is done properly, the remainder of the expense is materially lightened—three inches of gravel applied upon a well drained road is worth more than a foot upon a soft undrained one. These under-drains will be found invaluable, in the spring and after heavy showers, in carrying off the great surplus of water which is destroying the character of the road. But smaller showers, which are frequently falling, and do not penetrate the earth but a few inches, must be carried off by the shape of the road itself—being higher in the centre than at the sides—indeed, the middle should be so elevated that the sides should be a ditch of considerable depth.

The best instrument for rapidly performing this "turnpiking" that we have ever seen, is a scraper shaped like the letter A, drawn with the point forward, used by some plankroad companies in raising their roadway.

Fig. 6.—Cross piece.

There should be three cross-pieces, one about 3 feet long, one about 5 feet, and one about 7 feet. Length of scraper, 12 feet; width, 14 inches. The whole made of strong two inch oak plank, with a hinge at the angle.

The accompanying illustration will easily explain its construction and use, (fig. 7.)

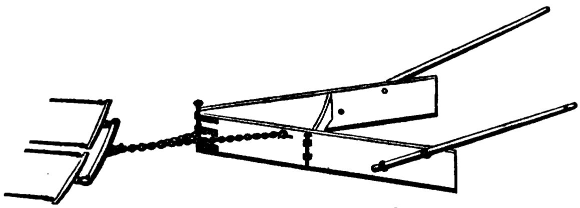


Fig. 7.—Scraper for Roads.

It is shod on the outside, with a strip of iron half an inch thick and two inches wide, which projects half an inch below the surface of the plank.

Its operation is as follows:—Back furrows are thrown upon the tile drain previously mentioned, and the plowing is continued for the distance of eight feet on each side. This plowing is repeated several times, until the ground is soft. The shortest cross-piece, (which makes the scraper three feet wide,) is then put into the scraper, and one side of the scraper runs along the side of the last furrow made by the landside, carrying all of the loose dirt three feet from the last furrow. When the scraper arrives at the end of the road under repair, you

Fig. 8.—Mode of throwing Back Furrows on Pipe Under-Drain.

Fig. 9.—Forming Road.

can go down on the opposite side in the same manner, or you can go down on the same side you came up, by putting in a longer cross-piece, throwing the dirt five feet from the last furrow plowed.

By repeated plowings on the side of the road, and using the scraper every furrow or so, the road is very rapidly and perfectly raised in the middle.

Two handles, about four inches in diameter and 12 feet long, are attached as shown in fig. 7, for the purpose of managing the scraper. It requires four horses to work it successfully. A half mile of road can readily be shaped in a day with it.

Care must be taken when forming the road to throw out all stones over two inches in diameter, for they will certainly, by the action of the frost, rise to the surface and be an annoyance and pest until removed.

When the road-bed is thus formed, with a good ditch on each side, with outlets for the discharge of the water, the remainder of the tax should be applied generally in putting gravel upon so much of the road-bed as is used

by one track, commencing in the poorest part of the road. If possible, gravel should be selected free from clay or other earthy matter, and free also from stones larger than two inches in diameter. The common practice is to hoe or rake these stones a little in advance of the gravel, and then with the next load to cover them slightly, when, after a few weeks, they appear upon the surface, to the chagrin and annoyance of every one. They should in all cases be removed at the time of making the road—it will then wear down smooth, and hard and durable. Five inches of gravel applied in this way, upon a drained and raised road, will last in good condition an almost indefinite length of time, and will be a pleasure and satisfaction to the traveler.

A rapid and effectual method of repairing the roads in the spring, which is adopted in some parts of the country and should be in all, is to drag a scraper, (the one described would answer well,) two or three times along its whole length, filling up the ruts and rendering the surface smooth. This, with the thorough removal of all stones which appear at the surface, would render many miles of highway now almost impassable, very tolerable. This expense is so slight, and the work is done so rapidly, that there is no excuse for its neglect.

If the road commissioners would appropriate a small sum, and engage a competent person to take the job, all the roads in a town could be speedily gone over in the spring, and the amount thus spent would be more than one hundred fold returned to the public. If this is left for the different districts to do, it will be neglected, as very few have scrapers, and what few have them will not do it in season.

We have said that no stones should be put into the road. This needs a little modification. In many places, over soft and springy land, where a solid foundation is difficult to make, cobble stones may be very advantageously used, by placing them in regular courses, with the small end upward. If the ground is very soft, a few inches of small stones should be placed under this pavement, to prevent them from sinking into the soil.

Over this pavement of stones, gravel free from stones larger than 2 inches should be deposited at least eight inches deep, which will wedge into the places left by the small ends of the stones, and thus effectually prevent them from rising to the surface, as they almost invariably do if thrown in without any arrangement.

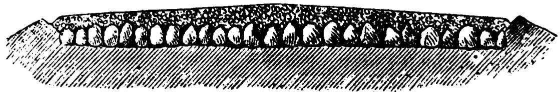


Fig. 10.—Section of Telford Road.

This plan is one invented by the celebrated English road maker, Telford, and extensively employed by him in constructing some of the finest roads in Europe. He uses broken stone upon the cobble stone foundation, instead of

gravel, which renders the road better and more durable. The reason for placing the small ends uppermost is apparent to any one, upon the least examination, as by this means every stone is a wedge, which to come to the surface must drag its large end through the compact gravel over it; when, if thrown in without order, often the large ends are uppermost, and the frost and shaking of the passing wagons cause them to ascend to the surface, and these give room for others to become loose, and the whole road is spoiled. A little care in placing them renders the road durable for an almost indefinite length of time.

In many parts of the country, where small stones are abundant, thus paving the soft places will be found a most effectual and cheap method of repairing the road; but it must be borne in mind that its principal value depends upon the manner the stones are placed, and the thickness of the gravel over them. For unless these two points are well attended to, it soon becomes disagreeably poor and rough.

The previous suggestions contain the principal points which are applicable to roads in the country, where but little can be done at best, and this little spread over a large amount of surface.

There are usually three different kinds of materials to be used in the construction of roads, and these must be employed as they may happen to be found in their respective districts of country. The first two are gravel and stone; the third is hard soil, or hard-pan. The former make the most perfect roads, when used as already described. But where they are not to be had, the hardest earth must be sought. The worst of all material is the soft top earth or mold, which, although excellent for growing crops, makes a wretched wagon track. The worst thing, therefore, that a road maker can do, is to form a "turnpike" by heaping together this soft soil. Such roads have, however, been sometimes greatly improved by scraping wide and deep ditches on each side, and placing the hard-pan obtained from them on the top of the road. If this hard-pan bridging is so thick that heavy wheels can never cut through, it answers well; but if the wheels should happen to find their way down into the black mortar beneath, the mud becomes intolerable. It is hence always advisable to throw none of this surface earth into the newly formed highway. Excellent roads, on the contrary, have been formed by scraping or carting the top soil to the adjacent fields, and then forming a moderate ridge of the remaining hard pan, with a drain on each side. Such a road, although costing considerable for construction, has proved hard and durable, and has never cut into deep ruts.

Nearer large towns, and on roads of a more public character, broken stone becomes a necessity, a brief description of which we introduce here.

These are of two sorts, named from their inventors, both great road makers in England. The first by McAdam, hence called McAdam, or McAdamized roads, we shall first consider. The results of his observations were, that large round stones among gravel would NEVER PACK FIRMLY, but

would for a long time keep rolling around before the wheels of the passing wagons, until they were broken into small and angular pieces, and then become cemented together, as it were, and form a hard and smooth surface. He hence infers that it would be cheaper to break these stones by hand, into a proper shape for packing, than with the passing wagons—and of course no rounded stones should ever be used until broken.

Small angular stones are the cardinal requisites. When of suitable materials, of proper size, and correctly applied, they will unite and consolidate into one mass, almost as solid as the original stone, with a smooth, hard and non-elastic surface.

Hard stones form the best roads, as soft ones wear rapidly away; but, as the expense of breaking them is much greater, the usual plan is to put softer stones in the bottom, and cover with hard ones on the top. In the avenues of New York broken gneiss, which is quite soft, is placed below, and covered with broken boulders, which cost three times as much to break.

As stone is very expensive of transportation, those in the vicinity will generally be used, and the selection of them should be made as suggested above.

An important part in using broken stone is to reduce them to a small size. McAdam's rule was, never to use a stone whose longest diameter exceeded $2\frac{1}{2}$ inches; or, in other words, one which would not go through an iron ring of that diameter, was to be rejected; or, in weight, one which would exceed 6 oz. was not to be used; and he instructed his overseers to carry with them a small scale, to weigh the broken stones, and refuse larger ones. Some other road makers prefer stones even smaller than this, or three ounces in weight.

The thickness which is necessary to cover the roads, depends, as we have before mentioned, on the character of the road-bed itself. If it be made dry by drainage, one-half of the covering used on a wet and undrained road will answer as well. Six inches of broken stone is ample, while if the road-bed is wet, 10 or 12 are necessary. Its thickness should be so great as to prevent water running through it, and strength enough to prevent its being shaken by heavy wagons in the spring, when the ground is soft from the frost having recently left it.

The proper manner of applying the stone is to put it on in layers of 3 or 4 inches at a time, and allow this to become thoroughly packed together and cemented, and then apply a second coat; the whole bed thus becomes, as it were, a solid mass, like a smooth rock of the same thickness.

The middle should be higher than the sides, for the prompt drainage of the surface water. It does not, however, require nearly so much elevation as dirt roads, where the surface is softer and the water soaks into them more readily. One inch in thirty is about the proper elevation of a good stone road—i. e., if the road is 15 feet wide, the middle should be about six inches higher than the sides.

The Telford differ from the McAdam roads, by having the foundation formed, as already described, of stones several inches in diameter, placed on end, with the small end uppermost, the largest ones in the middle of the road, forming a sort of arch. Broken stone is used on the top of these. Telford claims that the foundation thus made gives a firmer base for a road than when composed wholly of brokén stones, besides being much cheaper.

We have not space in this article to give the description of plankroads used in some portions of the country, and will only observe, that the rapidity with which they decay is a great and fatal objection to them, except near large towns, where there is a great amount of travel—in which cases they are sometimes profitably employed.

The Direction and Laying Out of Roads forms a very important subject of consideration.

We notice but seldom that roads are laid out around a hill, in order to avoid it, but with an inflexible determination they pursue their way, regardless of steepness or difficulty of ascent. In many instances the distance around a hill is but slightly greater than over it, when it is sheer waste of labor and time to drag heavy loads, or light ones either, over them. The example, that a pail bale is no longer when lying down than when standing, is familiar to every one. But even if the level and curved road were much longer than the straight and steep one, it would almost always be better to adopt the former; for on it a horse could safely and rapidly draw his full load, while on the other he could carry only part up the hill, and must diminish his speed in descending it.

As a general rule, the horizontal length of a road may be advantageously increased to avoid an ascent, by at least twenty times the perpendicular height which is to be thus saved; that is, to escape a hill a hundred feet high, it would be proper for the road to make such a circuit as would increase the length two thousand feet.

The mathematical maxim, that a straight line is the shortest distance between two points, is thus seen to be an unsafe guide in road making, and less appropriate than the paradoxical proverb, that "the longest way around is the shortest way home."

The gently curving road, besides its substantial advantages, is also more pleasant to the traveler upon it, for he is not fatigued by the tedious prospect of a long, straight stretch of road to be traveled, and is met at each curve by a constantly varied view.

The objection that curved roads are longer, and occupy more land and time in traveling than straight ones do, is only partially true; for the difference in length between a straight road and one which is curved so much that the eye can no where see farther than a quarter of a mile, is only one hundred and fifty yards in the distance of ten miles—an almost inappreciable amount—and yet the curves might be so arranged as almost to avoid the hills along its route.

When the roads are all laid out at right angles, as they are in some portions of the West, a person traveling across the country in a diagonal direction, will have to make a series of zigzags to accomplish the result—miles farther than would otherwise be necessary.

The assertion is often made that hills along a road serve to rest the horses, and that they can perform a journey easier along a hilly road than on a level one. It is said that the alternations of descents and levels call into play different muscles—allowing some to rest while the others are exerted—and thus relieving each in turn.

Plausible as this speculation appears at first glance, it will be found on examination to be untrue, both mechanically and physiologically; for, considering it in the former point of view, it is apparent that new ascents are formed which offer resistance not compensated by the descents; and in the latter, we find that it is contradicted by the structure of the horse. The question was submitted, by Mr. Stevenson, to Dr. John Barclay, of Edinburgh—no less eminent for his knowledge than successful as a teacher of comparative anatomy, and he made the following reply:

"My acquaintance with the muscles by no means enables me to explain how a horse should be more fatigued by traveling on a road uniformly level, than by traveling over a like space upon one that crosses heights and hollows; but it is demonstrably a FALSE idea that muscles can alternately rest and come into motion in cases of this kind. * * * Much is to be ascribed to prejudice, originating with the man continually in quest of variety, rather than with the horse, who, consulting only his ease, seems quite unconscious of Hogarthianism of Beauty.

"Since this doctrine is thus seen to be a mere popular error, it should be utterly rejected, not only because false in itself, but still more because it encourages the making of undulating roads, and thus increases the labor and cost of carriages upon them."

Any laborer may practically satisfy himself on this point, by first wheeling a hundred loads of stone to a distance of ten rods, over a smooth and level surface of plank; and then wheeling the next hundred up a hill of ten feet rise, and then down again, to the same distance as before. He will then unquestionably select the level path in future.

WALKS AND SHADE TREES ALONG COUNTRY ROADS.—A law was passed at the last session of the Legislature of this State, empowering land-owners to make sidewalks and plant shade trees along the highways bordering their property, and to erect a railing to protect the same—the width of the walk limited to six feet, for a road not over three rods wide, and one foot additional for every additional rod in the width of the road. That is, the line of shade trees may extend so far into the road; but the railing protecting them may be at a farther distance, not exceeding 30 inches, and is to be not more than one bar in height, with posts.

MANAGEMENT OF SWINE.

It is not intended to furnish, on the present occasion, a complete treatise on the Management of Swine, but rather to give some brief statements of the successful practice of a few farmers, who have rendered this branch of husbandry a business of especial profit. For the information, however, of many young farmers, who have made frequent inquiries for such directions, a few brief general hints will be given.

There is no animal of more universal value than swine; and every cottager may keep one or two animals on the waste material of the kitchen, which would otherwise be thrown away and lost. Yet, in many respects, no animal is more neglected. Pigs are generally allowed the last chance in a barnyard; they are fed what other animals leave, and what no others will eat; and a heap of half decayed straw is their only bedding. They are called "dirty," because they are compelled to live in the dirt, or because the comforts of life cannot be otherwise obtained. Yet no animal more highly appreciates a good, dry, clean, comfortable dwelling—and no animal is more careful, when thus provided, to keep entirely separate their food, bedding and manure. One great reason why many farmers find the keeping of swine unprofitable, is the impossibility of the discomfort of filth and the profits of thrift existing together. The experiment has been made of currying hogs, and it was found to promote their growth and fattening; and another experiment was made, by washing them weekly, with soap and brush, and the increase over those not thus treated was found by weighing to be as 5 to 3.

Pig Houses.—One of the first requisites for successful management, is comfortable quarters for the animals. A good plan of a building for this purpose, where the apartments for bedding, feeding and cooking, and for large and small animals, are conveniently separated, is shown on page 33, Vol. II, of Rural Affairs. The accompanying plan, (fig. 1,) is for a smaller number of animals. The door enters the cooking room; the stairs pass to the loft, where the feed is kept; on the left side of the feeding pen, and under the window shown in the plan, is the door for the pigs to enter; on the other side is the manure window.

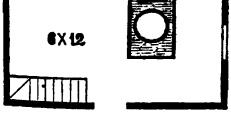


Fig. 1.

Different modes are adopted for the drainage of the floors. The most common is to give a slope in every direction from the centre, with gutters around the circumference to carry off the liquid manure into tanks or heaps of turf or rubbish; another mode, and in some respects more convenient, is to give a

descent of the floor toward the centre, where an iron grate is placed, with spaces narrower than the animals' feet. This grate, as well as the gutters mentioned in the other plan, should be kept clean, and preserved from being choked, for which end the daily use of a pail of water is advantageous. The apartment should be thoroughly cleaned at least twice a day. Another mode is to cover the whole floor with an ample coating of dry straw, which absorbs the liquid parts. The moistened portions of the straw must be removed daily.

Fig. 2.—Circular Iron Pig Trough.

The best feeding troughs are made of cast iron. Good ones may be made of white oak, bound on the edges with thick sheet iron, to prevent the animals from gnawing them to pieces.

The ground on which the building stands should be a dry spot, to prevent the formation or accumulation of mud; and the cleanings should be kept intermixed, or covered with soil, peat, sawdust, or other absorbent, so as to prevent foul air—for the constant breathing of impure and fetid vapors cannot fail to injure the delicate tissues in the lungs of any animal.

Breeding sows should be kept in apartments entirely separate from the other animals, and from each other.

Breeds of Swine.—It would be entirely beyond the limits of this article to even enter upon a discussion of the merits of different breeds. There

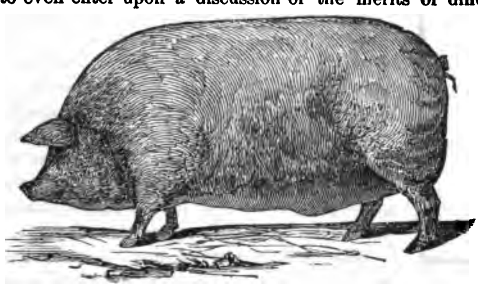


Fig. 3.—Chester County.

are a few, however, that have become general favorites, among which are the Berkshire, Suffolk and Essex, and the less permanent but excellent breed known as the Chester Whites. The larger Yorkshires are obtaining much favor for crossing with the Suffolk and Berkshire, and the cross thus obtained forms an excellent, good sized, and easily fattening animal. An admixture of Berkshire

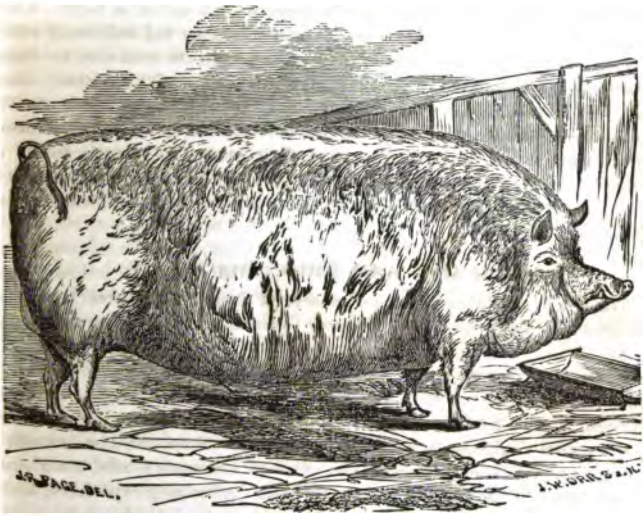


Fig. 4.—Suffolk.

or Suffolk blood with any of the large boned native varieties, greatly improves them in every respect, and especially in their capability of fattening. Figures of animals of these breeds may be found on pp. 95, 225 and 227, of Vol. I, of Rural Affairs.

It is to be regretted that no accurate experiments have been made by weighing and measuring the food, and determining the increase of the animal, for the purpose of demonstrating the relative amount of pork which each of the breeds will manufacture from a bushel of corn, or a given quantity of other food.

Parturition.—The boar and sow are capable of breeding at six or seven months, but should not usually be allowed to do so until the sow is one year and the boar eighteen months old. If, however, the sow has a strong tendency to fatten, she may be allowed to breed at nine months, and as often as three times a year; but commonly twice a year is often enough, namely, for spring and autumn pigs. The first should come early in spring; the second, about the first day of autumn, or sooner. One boar should not serve more than six or eight sows in a year. They may continue to breed from three to five years, if desired, and if the sow continues prolific. Eight or nine pigs at a time may be allowed to remain. Gestation usually continues nearly four months; but in extreme cases has been known to vary thirty days. Feeble animals do not carry their young quite so long as others. The old

rule for the time was: "three months, three weeks, and three days," which is nearly the general average. The animals should be fed well until within a week or so of the usual time for parturition, when the feed may be diminished, the object being to maintain a good vigorous condition without much fat. While suckling, the sow should be well fed, to promote a flow of milk, until weaning time, when the supply of food should be again diminished. When animals are disposed to destroy their young, the mouth should be strapped, except when they are fed. Too much straw should not be used at this time for litter, as it may hide the young pigs and cause the sow to overlie them.

Feeding and Fattening Swine.

The details of the management of several farmers, who have been very successful in pork raising, will probably be more interesting than mere directions.

MANAGEMENT BY NATHAN G. MORGAN.—One of the most successful pork raisers in the country, on a small scale, is Nathan G. Morgan, of Union Springs, N. Y. He has formerly been an extensive farmer, but now occupies a model miniature farm of only eleven acres, from which he has sold in a single season, besides furnishing supplies to his small family, $300 worth of produce; he usually averages about $200. After long experience, he has come to the conclusion that pork raising is the most profitable of all branches of husbandry, not even excepting the wheat crop. Raising and fattening cattle he has long since discarded.

He keeps constant and accurate accounts of all his operations, and his conclusions are, therefore, not mere guess work. He finds the value of corn doubled by grinding and scalding the meal. He pours ninety pounds of hot water on sixteen pounds of meal, and allows it to stand in a covered tub from 12 to 18 hours, according to the weather, before feeding. The whole mess swells so as to make thick feed, although three or four pails of water are required for one heaping pail of dry meal. He considers meal mixed with boiling water one-half better than mixed with cold water, and double the value when in the ear. Feed thus prepared gives a dollar per bushel for the corn, where the pork sells for five cents per pound; that is, fifty pounds of meal make ten pounds of pork—thus the grinding and scalding double the value of the corn. He has not experimented with meal fed dry.

He usually begins feeding in spring with last year's pigs, when weighing about 140 lbs. each, and feeds the meal the season through, continuously, until late autumn. He thinks that spring pigs, fed in this way, are not quite so profitable, as they are fully under way growing when winter arrives and they must be killed. He has, however, been very successful with spring pigs; one at about eight months old having weighed 396 lbs., and another, at ten months, weighed 456 lbs.

He prefers the animals to have a small piece of ground to run in, instead

of being confined to a close pen—say one quarter to one acre, according to the number of animals. Their noses are kept wired, to prevent rooting. In the winter season they are kept shut up in pens, with plenty of dry straw for bedding. He feeds in the ear in winter, as the additional advantage at this time in feeding meal does not pay for the trouble. He never cuts the tail off, thinking this appendage is a continuation of the backbone.

He regards the commencement of feeding early in spring of great importance, and thinks a bushel of corn fed at this period will ultimately produce more pork than that which is given later in the season. Regularity in feeding is very carefully observed, as well as never feeding to satiety. As he does all the work with his own hands, these particulars are strictly observed in practice. The swine raised by him are native animals, with a large admixture of Berkshire and Leicester blood.

As a proof of the success of this admirable management, the following figures are copied from his farm record:

In 1829, he commenced fattening on the 1st of May, eleven hogs, weighing on average 140 lbs. each, and slaughtered on the 10th of November following, when they were seventeen months old. The gross weight, when dressed, was 5,198 lbs., or averaging 472 lbs. each.

In 1845, he commenced feeding one hog the 1st of April, when weighing 214 lbs. It was slaughtered the 1st week in November following, when the dressed weight was 766 lbs.

In 1846, he commenced feeding a poorly wintered hog the 1st of April, and slaughtered it the 1st of November following, weighing, dressed, 560 lbs., and was fifteen months old.

In 1854, he slaughtered one sow, nineteen months old, dressed weight 486 lbs.; and her six pigs, eight months and seven days old, dressed weight 2,031 lbs.—the heaviest pig weighing 396 lbs.

David Anthony, of Union Springs, who has had long experience in pork raising, in connection with weighing the animals, has arrived at nearly the same conclusion as N. S. Morgan, in relation to the value of feed. He says, when corn in the ear is worth 62½ cents, that he has found the dry meal to be worth 87½ cents, and the cooked meal \$1.12½ to \$1.25. His management is to feed on clover early in the season; then to turn his swine into the wheat stubble; and afterwards to fatten on corn meal. He often plants a portion of his crop, of the early Canada corn, so that he may commence the fattening early in autumn on fully ripened grain.

Feeding Sour Milk, Apples and Roots.—One of the best kinds of food for growing and fattening swine is sour milk, which should be fed in its undiluted state. Mixed with water, it merely distends the animal, without producing much fat or muscle, or makes it large bellied while poor. Apples, when abundant, constitute a cheap food for fattening hogs, but are too watery when given alone. Grain should be fed in connection, or in mixture, and towards the close of the fattening process, the apples should be nearly or

wholly omitted. The same remark will also apply to the use of cooked roots.

A writer on fattening, makes the following observation:—To ascertain the most profitable period for slaughtering, hogs ought to be weighed every week during the latter part of the process; for although their appetite will gradually fall off as they increase in fat, yet the flesh which they will acquire will also diminish, until AT LAST IT WILL NOT PAY FOR THEIR FOOD, and they should then be immediately slaughtered.

MANAGEMENT BY JONATHAN TALCOTT, OF ROME, N. Y.—The following statement has been kindly furnished for the REGISTER, and embraces some valuable results, as well as useful suggestions, and shows that the Suffolk breed, which was experimented upon, may be made to attain a large size. It will be observed that six quarts of meal gave three pounds of pork, or a bushel sixteen pounds, which is a little short of the amount determined by N. G. Morgan, and mentioned in this article:

"The pigs on which I have experimented are of the Suffolk breed, for the last six years; previous to that, I had the mixed race of the country—also of the Berkshire breed. I have never had pure breeds of either of the other races, except the past year I have had a single specimen of the Chester Co., but they do not impress me very favorably, as I think them mongrels, and too coarse in bone and harsh in their hair. There was so much said about them that I purchased one. I have seen a good many, but they do not please me as well as the Suffolk. I think, however, they (the Chester) are greatly improved by a cross with the Suffolk—it refines them in bone, also in hair and meat, very much, and perhaps the Suffolk also, as I think it a little too oily if fattened fat.

"The true object of the farmer should be to make his pork in the cheapest manner, and that race of swine that will make the most pork on a given amount of feed, if equally good, is doubtless the best for the pork producing farmer. This being conceded, it would seem that a few experiments with the different breeds would decide which is best. But, unfortunately, I have yet to see the man that has tested the different breeds in this way. We frequently get the published statements of large hogs and their great weights, but we are not told what they have eaten to make them such. At present, I can only give experiments with the Suffolk.

"My first experiment was with a hog about 15 months old, of the Suffolk breed. Live weight, August 16th, 360 lbs. He was fed on boiled beets, of the turnip and Bassano varieties, till Oct. 1st. Boiled tops as well as roots, in a potash kettle, set in an arch in the hog house, without milk or any other feed, and gained 2 lbs. per day. Was weighed September 1st, weighing 390 lbs.; October 1st, 450 lbs. He was then fed meal made of corn, buckwheat and oats, about equal quantities, and he gained 3 lbs. per day. His feed was two quarts of meal three times a day, wet with water, as given. On the 20th of October I weighed him, in presence of Enoch Marks, and he weighed

510 lbs. He was kept about one month longer, and weighed 610 lbs.—dressed 525 lbs.; loose fat, 30 lbs.; liver, tongue, head, &c., 25 lbs.; leaving only 30 lbs. for loss. He had not been fed, however, the day he was slaughtered.

"My only regret is, that I did not weigh the beets before they were boiled; also, that the meal was not all weighed, instead of measuring.

"This experiment, you will see, was during the summer and fall, when it is thought to be the most favorable time for fattening hogs.

"My second experiment was with a Suffolk hog three years old. He was fed in the winter, but had a WARM, DRY PLACE. He gained as fast on meal as the other; was fed as the first, except the beets. Dressed weight, 520 lbs., in the hog, not including loose fat. Was killed the last of March. He had been kept as a boar, and was castrated about the 1st of January; then fattened, as above stated.

"These are all the actual experiments I have tried, by weighing and measuring, and both were of the Suffolk breed.

"I do not approve of keeping hogs to that age for profit, as I think, with a good pig, they can be fattened at eight or nine months of age at more profit than older. The Suffolk will attain to from 200 to 300 lbs. at that age, if properly taken care of, and they have the advantage of the milk and buttermilk, from the dairy farmer.

"They should have all the exercise they can have, for the first three or four months of their life, as they are liable to get too fat if well fed and kept too close when young. I have found that by letting them run they will be larger and attain more weight, in a given time, than if kept close, as the Suffolk pig is easily fattened, even while young, and I have had them choke or clog with fat while young, say from three to six weeks old, and die, I think, from too high feeding and too little exercise—but have never lost any when they have had their liberty, and were fed only moderately till three months old. When they have attained some three or four months of age, then I think the faster they are made into pork the better; and then meal put in their milk as fed, I think, from observation, is as good as if cooked, or fed in any of the forms of scalded, soured with the milk, or any other way, and it is the easiest to put the milk into the trough when the milk is fed. By so doing I have had them attain the weights mentioned at that age, which I think is much better than to keep twice as long, and then get but a little more pork, and that not as nice as the pigs make.

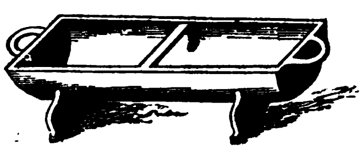


Fig. 5.—Cast Iron Pig Trough.

"In regard to raising, I think that an old sow is best, and if farmers would consult their interests, they would keep such, and fatten their pigs at an

early age, and save the wintering, which is quite an item of expense. The Chesters, also the Yorkshires, will attain greater weights, no doubt, but probably cost more than the proportion gained, in feed."

MECHANICAL CONTRIVANCES.

Self-Acting Sled Brake.

Brakes for heavily loaded wagons, descending steep hills, are familiar to all teamsters—chaining the wheels being common where no other provision has been made. But a serious inconvenience has existed with loaded sleds. William Barnes, of Newburgh, describes, in the COUNTRY GENTLEMAN, a convenient and perfect brake for this purpose, as follows:

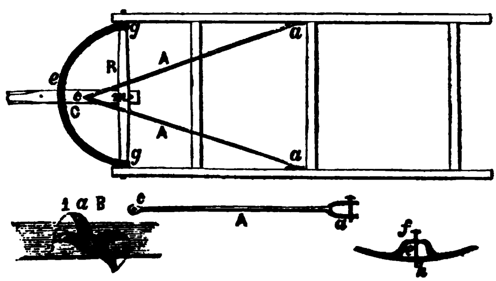


FIG. 1.—SLED BRAKE.

A. Rod fastened to tongue at c. and dog at a.
B. Dog fastened to runner by bolt b. 1 shows its position when going down a hill; 2, when the load has to be drawn.
C. Brace through which tongue slides at e, and against which bolt through whiffletrees and tongue draws at f, and h.

A tenon is cut on the back end of the tongue about 6 inches long, permitting it to play freely in the roller R, at m. The brace C, is made of a bar of iron $1\frac{1}{2}$ inches broad and $\frac{1}{2}$ inch thick, bent edgewise in a semi-circular form, with the band, (made of the same sized iron,) through which the tongue passes at e, welded to the upper side of the brace; the ends are made fast to the ends of the roller at g, g. The sled is drawn by this brace; the tongue is protected on the sides where it passes through the band by iron plates. The dogs B, one for each runner, are fastened loosely by a strong bolt passing through the runner. The connecting rods are fastened to the upper part of the dogs at a, a, and to the tongue by a bolt passing down through both and the tongue at C.

In going down a hill the tongue slides back through the band e, and the mortice m, pushing the connecting rods backwards, which in turn push the

upper ends of the dogs upwards and backwards, causing the lower ends of the dogs to move downwards about two inches below the runner, scraping in the snow, effectually braking the sled and checking its progress. In drawing, the whiffletree bolt passes sufficiently far through the tongue to draw against the edges of the band and brace at f, and h. To back the sleigh, a short bolt is inserted in a hole, d, through the tenon, so placed that when the tongue is drawn forward it will be just in front of the roller; this bolt pressing against the roller prevents the tongue sliding back and working the brake. Of course this bolt must be taken out when the brake is to be used, and replaced when it is required to back the sleigh.

In putting one of these on a sled, the upper part of the tongue, at C, must be blocked up enough so that the connecting rods will not touch the roller when the end of the tongue rests on the ground, or they will be bent and very much weakened. Neither must the upper part of the dogs be made so long, or be so placed, that when the tongue is raised the rods will touch the under side of the forward bench of the sleigh.

I have known a team of two horses, weighing about 1,000 pounds each, to draw 1¼ cords of wood at a load, on roads where they had to go down steep hills. The wood was loaded on a bob-sled, with a brake of this kind kept in good order. This brake is almost perfect for drawing heavy loads on a bob-sled. It may be put on any sled for from $5 to $7. It is the best for a large common sled that I know of.

The writer of the above adds, that when this dog is applied to a long sled it sometimes splits the runner, if improperly shaped, when striking a sharp obstruction.

Cattle Ties.

The above cuts represent chains for confining cattle in their stables. The large ring works up and down upon a round post, at the side of the manger; the ring being much larger than the post, admits of passing it over a short

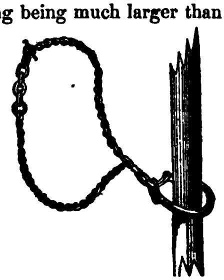


Fig. 2.

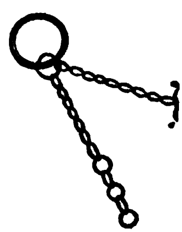


Fig. 3.

pin, which is inserted in the post above the height of the animal, on which it will hang until the animal steps up by the side, when the person in attendance takes the ring off the pin and passes the chain down astride the neck,

and draws the T on the one end of the chain through one of the rings, (according to the size of the animal's neck,) on the other end, as shown in fig. 3. This forms a neat, comfortable, and secure fastening—the chains slipping up and down a stationary post, as the animal rises or lies down.

This mode of securing cattle answers well where they are but few in number, and where there is a good supply of straw, and proper attendance can be given to preserve cleanliness.

Stanchions for Cattle.

In large dairies, well constructed stanchions have proved most convenient. Many of our best and most extensive dairy farmers, after trying different modes, have permanently adopted the mode of securing their cattle by stanchions. It possesses one great advantage, that of cleanliness, the animals not moving backward or forward, nor lying in their own manure. If well made

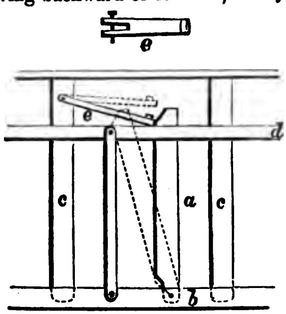


Fig. 4.—Isaac Garrett's Stanchions.

A, space for neck, 7 in. wide, edges rounded—b, sill at bottom, 6 inches square—c, c, posts 3 ft. 2 in. apart from centres, 2½ by 5 inches, horizontal pieces, d, bolted on each side, leaving a space the width of posts, for the movable slats to play in. The latter are oak, 1¼ by 6 inches, rounded at edge—e, latch, about 2 feet by 6 inches. The dotted line represents it as raised, when the weight of the movable slat causes it to fall back and release the animal.

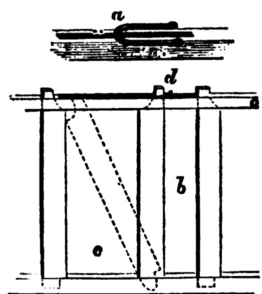


Fig. 5.—Edward Garrett's Stanchions.

Horizontal top piece, a, 5 by 3 inches—mortise in it 1½ in. wide, for movable slat to play in—the latter 3 by 1½ in. rounded on edge; fixed vertical piece, same size. Space for neck, b, 7 inches; wider space, c, 15 inches, which may be partly covered if necessary by a vertical piece nailed on, as in fig. 4. The movable piece, d, is secured to its place by a loop of iron resembling a clevis.

they appear to be as comfortable as any other fastening. The accompanying figure (4) exhibits the form of stanchion adopted by Isaac Garrett, a skillful dairy farmer, of Upper Darby, near Philadelphia. The dimensions are given in the description under the figure. The drain, into which the manure falls, is five feet two inches from the stanchions, is 18 inches wide, flat on the bottom, so as to receive a square shovel for cleaning. In large establishments, the movable vertical bars might be all connected with one long horizontal rod, as has been sometimes successfully done, so as to loosen or secure fifty

cows at a single motion of a lever—the animals all receiving their feed when returning to the stables, every one in its place.

Another form, slightly varying from the above, is the stanchion adopted by Edward Garrett, of the same place, and is shown in the accompanying figure, (5.) The top piece has mortises for receiving the stanchions, and requires more labor to make than the other, which is merely made of two horizontal boards nailed to the fixed stanchions, the movable ones playing loosely between these boards. The manger is about $2\frac{1}{2}$ feet wide at the top and $1\frac{1}{2}$ at bottom; and for cattle of the size here raised, 5 feet 2 inches is the best distance between the manger and manure gutter. The animals never waste any hay under their feet where these stanchions are used, but always waste largely when secured by chains or straps.

L. F. Scott states, in the COUNTRY GENTLEMAN, as follows:—"I built my barn in 1861, and for convenience, on my ground, it cannot be beaten. I have been on to the mow, pitched off hay, fed and put up twelve head of cattle, in just six minutes by the watch. I tie my oxen with a rope, and stanchion the cows. I have seen so many stanchions that were such miserable, uncomfortable things, that I was prejudiced against them—but for the sake of saving manure and keeping the cows clean for milking, I had some stanchions put up, on scientific principles, for trial, and after using them two years, I would not part with them for any thing else that I have ever seen, and the cattle appear to enjoy them as much as I do."

Movable Fences.

These are useful to the farmer on many occasions, such as dividing large fields temporarily, and inclosing animals on particular spots of ground. They are also useful for inclosing pigs and poultry, for a few weeks, among plum trees, during the Curculio season. The annexed figure (6) shows a mode of constructing hurdles for this purpose, extensively adopted in England, and to some extent in this country.

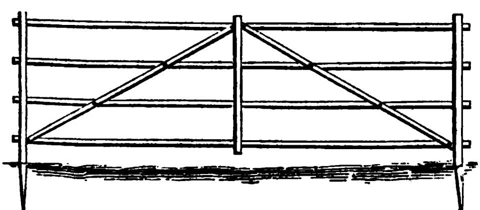


Fig. 6.—Portable Fence.

The fence consists of separate frames or "lengths," (one of which is shown by the figure,) with a sharpened post at each end, driven into holes made in the ground by a crowbar, and secured at the top by withing together, though the latter is not indispensible. These pieces are made of round poles or sticks split in two, the flat sides being placed next to the cross-bars, which are fastened to them by wrought nails at the point of intersection. The points of the posts are driven into the ground to the depth of about 14 to 16 inches.

Some years ago, the writer examined hurdles made in this way by Charles Downing, of Newburgh, that answered an excellent purpose. The fence was four feet high, and the frames each eight feet long. They cost, beside the material, $2.25 per dozen in making, or 37 cents a rod. The material would add about 13 cents more, making half a dollar a rod, for the whole. Two men put up thirty rods of the fence, securing the tops by withes, in about three hours.

Jack Screws.

These are often useful, in many ways, to every farmer. Barns, and other buildings, often settle slightly out of position, not only causing injury to the buildings themselves, but also interfering with a free opening and shutting of the doors, &c. A few minutes' use of one of these screws is generally

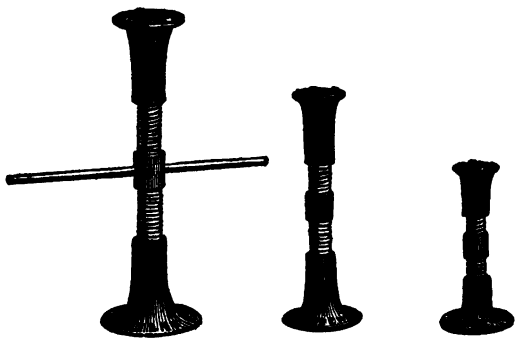


Fig. 7.—Jack Screws.

sufficient to set all right. They may be used for lifting any heavy body, and as a wagon-jack, for large or loaded wagons. The figure (7) exhibits Reed's patent, consisting of two screws, one above the other, moving in opposite directions, thus effecting double work at each revolution of the lever.

Draining Tools.

The following account is given, in the Country Gentleman, of the mode of constructing drains on the farm of Samuel Faile, of White Plains, N. Y.:

We might begin by remarking that in excavating the drains, Mr. Faile finds the English tools, though more clumsy in appearance, in the end more handy and serviceable than any he has been able to procure of American manufacture. Fig. 8 is a good representation of the English Draining Spade, and is in constant use. The tool for shaping and cleaning out the bottom of the drain, which is often made of the shape represented in fig. 9, proves much more convenient, in practice, to have the handle bent THE OTHER WAY,

Fig. 8.

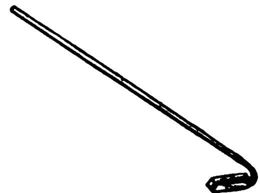


Fig. 9.

so as to use to push forward, instead of to draw back, and to shovel out with.

The ditch is thus completed, and the bottom properly shaped for the reception of the tile—round or pipe tile being preferred, almost as a matter of course, now-a-days. If it is as long an arm as many in Mr. Faile's fields, and with as hard a subsoil to excavate, it may require some days to finish it, and by this time considerable water will be running in it. The man laying the tile begins at the upper end of the drain; and as he stands, one foot before the other, in the narrow ditch, he will find, not only that his feet are constantly imbedded in a tidy little puddle, somewhat to his own discomfort, but also that they dam the water back, so as to interfere with the fitting of the tile nicely in its place; and, moreover, that his boots are constantly treading out of shape the neatly excavated channel, softening its bottom or sides, and interfering materially with the workmanlike execution of the job. To overcome all these difficulties at once, is the object of Mr. Faile's contrivance, (fig. 10,) which so completely effects the object as to render it surprising that no one should have thought of it before. A pair of Draining Shoes, if we may call them so, are made to attach to the foot in precisely the same way as skates are strapped on, as shown in the accompanying cut. This shoe is made of zinc or galvanized iron, long and broad enough to fit the foot, curving at the bottom like a semi-cylinder, and from two and a half to three inches in height at the middle.

Fig. 10.

The engraving represents it, perhaps, as rather too broad in proportion to its height. In practice these shoes are found to answer even a better purpose than was anticipated. The men put them on at first with some reluctance to rig themselves out in such a way. but soon became so fond of them that they would not dispense with them on any consideration. They exceed the anticipations of their value, because it is found that they answer so admirably to put the bottom of the drain in the right shape, as well as to keep it right. The water lying in the ditch runs through them without impediment, and as they are drawn backward or pushed forward if need be, they clear the way of any soil or other obstruction that may have fallen in the way, and but little practice only is needed to render them as handy in this respect, as they are convenient in not damming up the water or poaching up the mud.

Hook for Pulling up Bushes.

Since the general adoption of under-draining for wet, boggy or bushy land, it has become an object to remove easily and rapidly the roots of the bushes and brakes which infest such land. Doing the work by hand is too costly and laborious. It may be done with horse power, by means of the instrument figured in the annexed cut. The centre wheels, A, A, are light, and so placed that the puller balances on their axletree, in such a way that the heaviest part rests on the cast iron roller, B; the man who holds the handle, C, walks over the land as if he were plowing, and whenever he meets a shrub or bush which is to be removed, he presses on the handles and the points of the puller enter the ground behind the roots, while the pulling of the team will lift the whole forepart of the implement up till the desired extraction is accomplished.

Fig. 11.—Brake Puller.

Hand Cart.

This is a very useful implement on every farm, and may be used for a thousand purposes. It holds a position between the common cart or wagon,

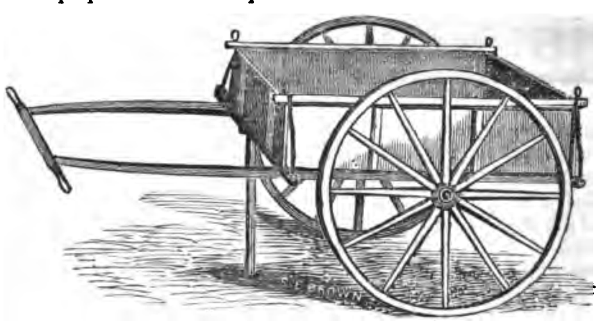


Fig. 12.—Hand Cart.

and a wheelbarrow. It may be used in many places, such as gardens, dooryards, &c., for conveying manure or drawing off rubbish, or stones, where the

larger vehicle would be inconvenient or do injury; and it is more easily drawn over soft surfaces, and will carry larger loads, than the common wheelbarrow. In many cases its ready use will save harnessing to a wagon.

Dirt Scraper.

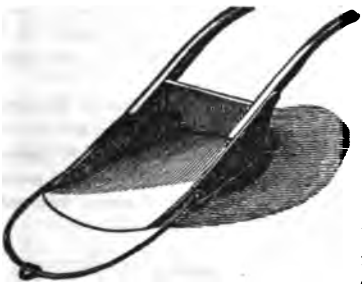


Fig. 13.—Cast Iron Road Scraper.

This implement is best and most durable made of cast iron—the handles being of wood. Although well known in many districts, it is worthy a brief recommendation to all, and is a convenient labor-saving implement in leveling knolls, filling hollows, smoothing piles of earth around new buildings, forming embankments of hard earth for farm roads, scraping out broad open ditches for streams, &c.

Farm Gates.

In volume second of Rural Affairs, pages 277 and 280, are given directions and several plans for constructing farm gates. The following, which has been found an excellent form, and which may be made for about three dollars, including material, is given as an addition to that article. The dimensions of every part are added, that the stuff may be procured of the right size and length, and save the cost of cutting away waste portions. It is 10 feet and a half long, and the following are the dimensions of the different parts:—Top piece, 10½ feet long, 3 by 4 inches at heel, and 2½ by 2 at latch end, is best made of elm or white oak, but will do of pine.

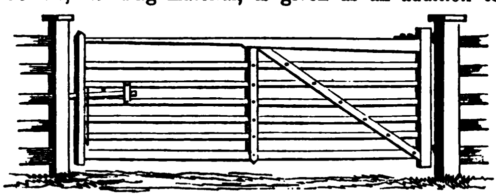


Fig. 14.—Farm Gate.

Six horizontal bars below, all an inch thick—the top one 2½ inches wide—the next four 3 inches wide, and the bottom one 4 inches wide—all of pine.

Heel piece, 4 feet 8 inches long, 4½ by 3 inches—head piece, or at latch end, 4½ feet long, and 2 by 2½ inches—both of oak, or other hard, tough wood.

Two perpendicular braces, (one on each side of the horizontal bars, opposite each other, secured by screw-bolts passing through the three,) 3 feet 8 inches long, 3 inches wide, and ¾ inch thick, of white oak.

Two diagonal braces, 6 feet long, 3 inches wide, and one inch thick, of white oak.

The latch plays horizontally or endwise between two vertical cross-pieces, nailed on each side of two horizontal bars, and through a corresponding mortice in the head piece. The latch is 2 feet long, 2 inches wide, and ¾ of an inch thick, of white oak. A vertical wooden spring screwed to the head piece, presses against a wooden pin in the latch, and keeps it shut. It is drawn back for opening the gate by means of another small pin in its upper edge.

The vertical and horizontal braces, being placed on both sides of the horizontal bars, and secured by screw-bolts passing through each, make a very strong gate, at the same time that it is very light. The whole cost, planed and painted, is about $3. In order to prevent the water of rains from penetrating the mortises, both mortise and tenon should be well coated with gas tar before the gate is put together.

Flat and Lapped Furrows.

It has been justly remarked that the cutter of a plow is as important to that instrument as the rudder to a ship; and while the depth should be

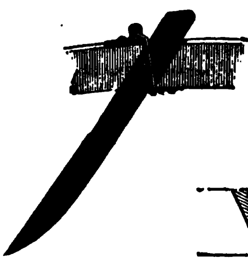


Fig. 15.—The Cutter,

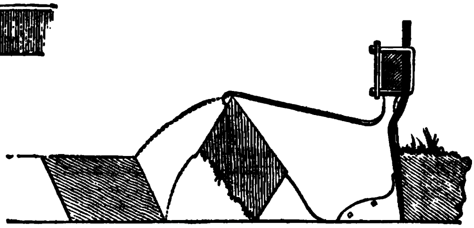


Fig. 16.—The Inclined Cutter, Laying Flat Furrows.

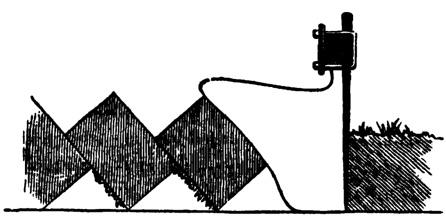


Fig. 17.—The Straight Cutter, Laying Lapped Furrows.

accurately graduated to correspond with the line of draft, the width and form of the slice as regulated by the cutter, has much to do with the particular style of plowing. Inexperienced plowmen are often puzzled to control the work so as to lay the furrows flat at one time, and to place them lapping when more exposure to frost and drainage is desired, at another. The accompanying

figures, showing the position of the cutter, serve to explain these two processes, without any further description.

The Kelsey Harrow.

This implement, although it appears as not yet to have been generally tried, evidently possesses some important advantages. Fig 18 is the common harrow, and is furnished with a horizontal handle, so that the driver has command of it by lifting, sliding sideways, &c. In fig. 19, it is rigged for harrowing corn the first time, the team being hitched to the loop A, the harrow running backwards, and the temporary handle, giving the driver command of the implement. The three central teeth are removed, to straddle the row; two horses being used, and two rows harrowed at a time, makes it an extra rapid worker. The harrow and scraper combined is shown in fig. 20, and it is thus used for leveling and smoothing surfaces.

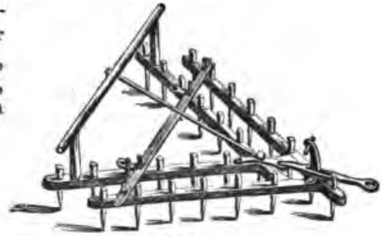


Fig. 18.

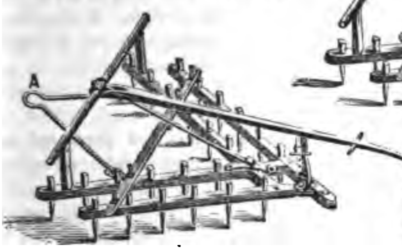


Fig. 19.

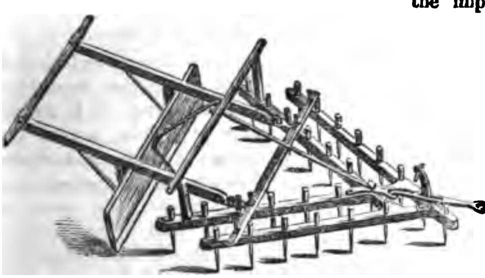


Fig. 20.

Geddes' Wool Press.

In order to do justice to a good fleece, and render it marketable, it should be neatly and handsomely tied up. To do this work perfectly and rapidly, nothing is probably better than the Wool Press, invented by James Geddes, of Fairmount, Onondaga county, N. Y. It consists of a firmly made box, supported on legs of convenient height; the length of the box is four feet, inside width 11 inches, inside depth 10½ inches. One end or head of this

box (*a*) is fixed, and strongly braced by a sort of iron bracket made for the purpose; the other or movable head (*b*), has a horizontal support, to which it is also firmly braced, and slides from the cleat nailed at *f*, up to within any requisite distance of the other head, *a*. Through both the heads there are three perpendicular slits which render so many braces essential to their strength, and thro' which the strings are extended for the tying of the fleece. In operation, these strings having been put in place, the fleece is folded to go into the box, but not rolled; the crank, turned by hand, and prevented by a ratchet from springing back, moves the roller at *d*, which, by means of the strap shown at *c*, pulls up the follower, *b*—the strings are secured; the catch lifted and crank reversed, when the straps at *g* draw back the follower, and the fleece is released in perfect shape.

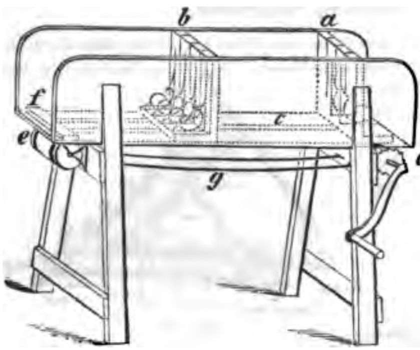


Fig. 21.—Geddes' Wool Press.

Hand Cultivator, for Garden Use.

The accompanying illustration represents an implement made by Haines & Pell, New York, for the cultivation of roots or any garden vegetables, between the rows. It is pushed forward by a long handle, the lower part of which only is shown in the engraving, the wheels and knives straddling the rows, so that the whole space between them is cut over and loosened up, the first set of knives being adjusted as closely as practicable to the row, and the others spreading apart as widely as the distance between the rows will admit. It seems to be a convenient and promising tool.

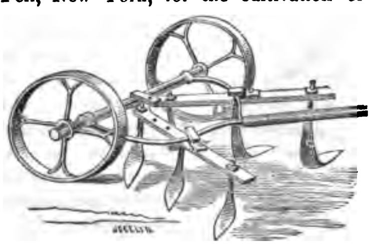


Fig. 22.—Hand Cultivator.

The Total Value of Agricultural Implements and Machinery in use in the United States was returned at $247,027,496 by the Census of 1860, against $151,587,638 in 1850—an increase not far short of 100 per cent.

DAIRY FARMING AND CHEESE MAKING.

Very clear and concise directions were published on the subject of Cheese making, in the last number of the ANNUAL REGISTER. Illustrations of the best apparatus employed in the process were also given. There is consequently less to be said in the present article, without repetition, than would otherwise have been the case. But the Cheese manufacture has reached such a degree of importance among us, and the interest felt in Dairy Farming and its improvement has extended so widely, that it seems expedient to treat them still a little more fully,—to present examples, in practice, in addition to the specific instructions heretofore prepared,—and to include something of the general management of the Dairy Farm, as well as the immediate manipulation of its chief products. For this purpose the writer spent several days, toward the end of June, 1863, in visiting cheese farms and factories in the counties of Oneida and Herkimer, where great success has been attained, and the results and observations derived from the tour are condensed, in the following pages, into as brief and systematic form as practicable. We shall speak first of the CHEESE FACTORIES, as being the subject which is now attracting most attention in the Dairying region of New York, and about which there is much inquiry from other States, and then of private Dairies and Dairy Farming.

Cheese Factories.

IN SWITZERLAND.—In the joint management of an establishment for making cheese from the milk of a large number of cows, the Swiss originally set the example, we believe, which is now finding so many imitations here. The cheese factory is there an "institution" of quite modern introduction, however; we find no mention of any thing of the kind in Loudon's review of Swiss Agriculture about forty years ago. But their growth in popular favor has been very rapid; and the production of the article, which has always been a staple, in the cantons of Freiburg and Vaud, perhaps especially, has been stimulated under the Union system, and a constantly increasing degree of prosperity has been the result. The former of the two cantons named includes the Valley of La Gruyère, which gives its name to the cheese exported to other countries, in immense quantities; but we failed to procure any statistics, in passing through it some years ago, on which dependance could be placed, as to the proportion of cheese made in the factories, or the number of them in operation. Miss JOHNSON, in her entertaining work, the Cottages of the Alps, states that there were, the same year, (1859,) in the single Canton de Vaud, no less than 433 "cheese societies" of this kind;*

* As the area of this canton is not quite 1,200 square miles, this would be equal to one dairy factory for the farms of about every 1,750 acres of land.

and it is possibly not an extravagant presumption that a large part of the Swiss cheese is now made on the factory plan.

IN OHIO.—Cheese factories were also tried some years ago on the Western Reserve in Ohio. In or about the year 1849, there were a number of establishments started, which purchased *the curd* unsalted from the farmers around, attending only to its pressing and curing themselves. In 1850, THE CULTIVATOR stated that Mr. Geo. Hezlep, of Gustavus, Trumbull county, was purchasing the curd made from the milk of 1,000 cows, paying from 3¼ to 3½ cents per lb. for it, and making from 100 to 120 cheeses daily. Several correspondents spoke well, at that time, of the satisfactory nature of these enterprises, and of the success they were attaining. But a few years later they "went under," one after another, and in 1859 they were said to have all disappeared, "most of them ruining their owners."

There is so little analogy between the system of factory operations indicated above, and that we are about to describe, that the failure of the one, after several years' trial, can scarcely be regarded as militating against the prospect of permanent success for the other.

THE FACTORY SYSTEM IN CENTRAL NEW YORK.—Mr. Jesse Williams is the pioneer in the establishment of the present way of conducting the cheese factories in Central New York. Having been all his life engaged in cheese farming, and making an article which commanded always the best price, he was led by degrees into the way of taking the milk from others to manufacture, until a few years ago he was receiving the milk of several hundred cows, and erected rough buildings expressly for the purpose. The success of the enterprise has led to the gradual erection of other factories, since 1860, and the number in operation or in progress in 1863 had become quite large, particularly in Oneida county, along the headwaters of the Mohawk, and to some extent in the counties of Herkimer, Oswego, Cortland, and perhaps also in the cheese region of Ohio.

System of Management.—There are two ways in which the business of the factories is conducted:

Under the first, a specified price, generally one cent per lb., is paid for the making of the cheese; an account is kept with those whose milk is sent to the factories; and the returns of sales are divided, after deducting the one cent per lb., together with the cost of bandages, annatto, or other material required, in proportion to the quantity of milk furnished. The contributors carry their own milk to the factory morning and night, or several of them in the same locality hire this done. In some instances, competition has led to the factory's collecting the milk without charge; but this is a tax it can hardly be asked to bear. The whey also goes to the factory, and is fed to pigs, "boarded" by the proprietors, at say 12½ cents per week. At the factory of Williams & Wight, Whitesboro, where milk was received from between 600 and 700 cows, 119 pigs were thus taken to board, at the price named.

Another system, of later introduction, approaches more nearly to the character of a "mutual benefit" arrangement than of a private enterprise. Instead of a charge of so much per lb. for making the cheese, the factory is erected by the parties who are to contribute the milk; and, in the settlement of accounts, the salary of the superintendent, and other expenses, together with such a per centage on the capital invested as will pay for repairs, as well as interest to the shareholders, are deducted before a division of the returns, in proportion to the amount of milk contributed by each. The charge of 15 per cent. is thought to be sufficient to cover both interest and repairs. On this system the Rome Cheese Manufacturing Association, of which Mr. Jesse Williams is the Superintendent, is conducted, and it is thought that with the business carried on upon a scale of sufficient extent—say in making up the milk of 800 or 1,000 cows—the net cost of the process will amount to not more than a small fraction above one-half cent per lb., thus effecting a considerable saving over the other system.

In factories of both kinds, the milk of small producers may be bought for manufacture, the proceeds of which would of course be divided in proportion to capital, if the milk is bought on account of all the stockholders.

Arrival of the Milk.—The milk is now brought to the factories mainly in a kind of can which we have nowhere else seen, or heard described, although it may be in use in other localities. The cans are of tin, of circular form, holding from 30 to 80 gallons; the covers have a flange six inches wide, which fits into the *inside* of the can as exactly as possible. An aperture is made in the top of the cover, with tin rim to contain a cork; this acts as a vent, to allow the escape of the air when the cover is put into the can; it goes down to within half or three-quarters of an inch of the surface of the milk, when the vent is corked, and the milk is so closely confined that there is no splashing at all, and comparatively little agitation in hauling it to the factory. The cork must be removed, of course, to get the cover out; for the flange fits so closely to the inside of the can that the full pressure of the atmosphere is exerted upon the top of the cover. These cans are driven long distances without a drop of the milk finding its way out on to the top of the cover. They are provided with a spigot to draw off the milk at the bottom, and are sometimes made, for the use of a particular factory, all of the same diameter, so that a single gage-rod will show the quantity contained in each, without other measurement.

On reaching the factory the milk is weighed out, however, and the number of pounds by this weight credited at once to the sender; it then runs off into the vats below. The accounts of the factories are properly kept by weight of milk; and the system of wine and beer gallons *should be* wholly discarded. The beer gallon, containing 282 cubic inches, has been introduced in the purchase of milk, in place of the common wine gallon of 231 cubic inches, because farmers who had milk for sale were found more ready to give a larger gallon than to receive a price nominally smaller. But this

leads to confusion. If *pounds* only are spoken of, every one will understand what is meant, while with gallons one man intends one thing, and one another.

Good Cool Water.—This is a prime essential to the success of the factory. The vats are about half filled with the evening's milk, received as above; cold water is introduced into the vacancy surrounding the bottom and sides, and kept running during the night. It is a good cool spring which will bring down the temperature of the milk in warm weather to 58° or 60°; and, as in very warm weather the process of cooling is slow, pans containing ice may be floated in the milk, or its contents gently stirred, to bring the milk successively in contact with the sides and bottom of the vat. The great objects in view are to prevent the souring of the milk, which is in factories the chief danger to be guarded against, and also to prevent the rising of the cream as much as possible. Some of the factory managers add four or five pails of cold water to the vat of night's milk, but this is not practiced by Mr. Geo. Williams, and the temperature attained during the night is sometimes as low as 50.° As the particles of milk sink as they are cooled, a false cover for the vat was suggested to Mr. W. during our visit, through which the water might run during the night, as well as beneath and on the sides of the vat, drawn out from the cover by a syphon regulated so as to keep its mouth always at a certain depth below the surface of the water, as the quantity might be variable.

The Vats, used at the factories, are simple oblong tanks of wood, with an inner vat of tin, leaving a space between the two of one and a half inch on the bottom, and one-half inch around the sides, for the admission and circulation of water and steam. They contain from 4,000 to 4,500 lbs. of milk. The thermometer may be conveniently suspended from a pulley over each vat, with weight at the other end of the cord, at the side of the room; it is thus plunged into the milk and withdrawn out of the way, without leaving the side of the vat.

Setting the Curd.—The morning's milk, as it comes in, is used to fill up the vats, (already half filled with that of the night before,) to their entire capacity; and if the temperature, after the two are intermingled, is found below 82°, steam is admitted around them—the space being partially filled with water, until this temperature, (or in some cases a degree or two higher,) is attained. A *slight* portion of annatto is added; the hue desired not being a deep one, but rather like that of rich cream, or, when the cheese is finished, a good butter color. The rennet is also put in—its amount being one of those things for which no specific rules can be given; the experience of the maker, and the relative strength of the rennet, determine how much will induce coagulation in from 40 to 45 minutes.* During this time the vat may

* Directions for the preparation of Rennet, together with much other information, will be found on page 259, &c., ANNUAL REGISTER, 1863, or Vol. III, RURAL AFFAIRS.

be covered with a cloth. When perhaps an hour has elapsed, and the curd has the right firmness of texture and clean fracture, it is cut perpendicularly

Fig. 1.

with the curd knife shown in the annexed figure, (1)—a knife with five two-edged blades, (one of which is also shown separately,) sixteen inches long, seven-eighths of an inch wide, and one-fourth to one-half inch apart. This curd knife is generally considered a great improvement, although there are some who still use the old wooden cutter, with its ashen blades two inches wide and the same distance apart.

Soon after this first cutting, longitudinally and transversely, so that the curd stands in perpendicular columns, the whey separates sufficiently to stand over the top of the curd. Steam is then admitted, until a temperature of 86° or 88° is attained—the attendant meantime gently stirring with the hands, for some minutes. After this stirring, in about twenty minutes, the whey is quite completely separated, and may be partly drawn off by a syphon, into a trough, which carries it out into the whey tank.

Cooking and Salting the Curd.—The curd is now cut and re-cut with the knife, and steam admitted until the temperature is brought up slowly to 98° or 100°, according to the judgment of the operator. This cooking of the curd is continued from one and a half to four hours; and it is upon this part of the process, and the skill with which it is managed, both as to time and degree of heat, that success is mainly dependant. The cutting and stirring continue during the cooking, at least until the particles are subdivided to about the size of large grains of wheat, and all are equally subjected to the cooking process, which is a part of the preparation that should not be hurried. When the curd is judged to be sufficiently cooked—a point determined by the feeling under pressure, and by experience—the remainder of the whey is drawn off. A sink on rollers runs along the side of the room at the head of the vats, and out into the apartment containing the presses. It has a perforated bottom, over which a sheet is spread, and the curd being placed upon this, the whey drains off and is carried away by an outlet underneath. The curd is stirred continually as it is put into the sink, to facilitate the process of drainage, as well as to prevent the particles from caking together, and salt is added, which is carefully intermingled throughout. Mr. Williams' rule is, two and seven-tenths pounds of salt to 1,000 pounds of milk. The vat, which we watched in the process of cooking and salting, at the Whitesboro factory of Messrs. Williams & Wight, we were told, had contained 3,900 lbs. milk, and that 10¼ lbs. of salt were put with the curd, which would be nearly in accordance with the above figures.

The Whitesboro Factory, here referred to, we should add, is a model of its kind. It stands, as they generally do, on something of a side-hill, so that the milk is taken from the wagons on to a platform within, high enough to be

out of the way of those passing below, and overlooking the whole room—on which platform the milk is weighed and credited, and the amount put into each vat computed, to regulate its subsequent treatment. A boiler set in brick-work stands somewhat to the left of this platform, with ten flues like those of a locomotive boiler, which makes the steam for heating purposes. That day, June 24, 14,915 lbs. of milk were received, and ten pounds of milk would make one of cheese. The press used is a simple screw press, or a series of them, side by side, to which the curd is taken as soon as salted, and the cheese hoops filled and placed under pressure. At night the cheese are turned in the press and bandaged; they are taken out the next day, after 24 hours are up. The labor of the factory is performed by three men and five women. It received the milk of 48 farms, or probably 650 cows, and had only been in operation since April 9th; its ultimate capacity is equal, we presume, to 1,000 cows.

THE CHEESE HOUSE, or curing building, is 30 by 100 feet in length, of two stories, lathed and plastered, ceiled and ventilated. It will contain about 200,000 lbs. of cheese, or 1,600 cheeses of the average weight of 125 lbs. as then made. Each story has shelving in four rows for cheeses to stand upon, each row containing two tiers, one above the other, and each tier two rows of cheeses side by side. An improvement has been adopted in the construction of this shelving, which renders the turning process much more easy. The *upper* shelf is not too high to be conveniently reached, not quite four feet; it is composed of two parallel pieces of scantling,* as shown in the annexed illustration, (fig. 2,) 14 inches apart, to support cheese of 21 in. diameter, which stand upon them in the covers of cheese boxes. It is easy to understand how very greatly the labor of turning is diminished by this contrivance—a second box cover being placed on top of the cheese, it swings down between the scantling so as to render it much more easy to place it "bottom up," when the cover on which it stood before is of course removed. (In the engraving, the strips of scantling do not appear quite *so far apart* as they really are. Some of the cheeses, also, have a rather one-sided appearance, which is the fault of the sketch, and not of the factory.)

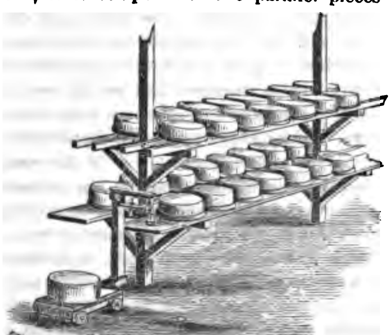


FIG. 2.

* Size of scantling, say four by five inches, with the top inner corners beveled down so as to make it five-sided, and permit the cheese to swing over more readily.

The *lower* tiers of cheese, it will be seen, rest upon a shelf, but in order to turn them with equal ease they are slid out from the shelf in the box-cover, upon a little truck of the same height, the top of which is composed of two pieces of scantling, and on which the cheese is turned, rubbed and greased, and slid back again upon the shelf. The storing and curing capacity of the room is thus doubled, while the labor of turning on either the upper or lower tier is actually less than on the old plan of one flat table or shelf, of the usual height.

The cheese are kept from 30 to 40 days before they are sold, daily turned, rubbed and greased. The whey butter used for grease is tinted with annatto to about the same shade as the interior of the cheese, and the four or five hundred cheeses which we saw at this factory were as uniform in all respects as cheese well could be made.

The Cheese Boxes, for the use of the factories, are made with greater care, and of greater strength, than has been generally customary for private use. This is not only to give a better and more uniform appearance in selling, but in order to afford more secure protection in transportation. The cheese are 21 inches in diameter, and average, at the factory of Messrs. Williams & Wight, about 125 lbs. weight. About 17,500 lbs. had already been sold, at the time of our visit, during the season, at 12 cents per lb.

The system of cheese making at the factories, as above described, differs mainly from that in private dairies for two reasons—first, owing to the greater hazard of souring to which the milk is liable in being carried to them, and from any carelessness in contributors in not having their cans perfectly sweet; and, in the second place, as regards the temperature at some stages in the process, owing to the larger quantity of milk together, so that a lower heat will often answer than is necessary where a smaller quantity would retain it for a shorter time. Each cheese, we should add, is marked neatly with the date at which it was made, and with its weight. There are slight variations in the system of manufacture at the different factories. Thus, there are some who, after adding the rennet to set the curd, *stir* the milk until the action of the rennet is perceptible, then covering the vat and letting it stand until sufficiently firm for the first cutting with the curd knife.

Other Factories Visited.—Among the factories we visited, beside that at Whitesboro, already referred to, was that of F. B. Smith, at Delta, which commenced operations in 1861, when the milk of 393 cows was made up; in 1862, the milk of 440 cows; and in 1863, that of 575 cows was received. The amount of cheese made, cured and sold in the season of 1862 was 164,000 lbs., being an average of about 372¾ lbs. per cow. It was the practice here to skim off the cream that had risen upon the night's milk, and run it through the strainer with the morning's milk, to intermingle the whole more perfectly. A wooden cutter, with blades two inches apart, was used for the first cutting; and, for the subsequent breaking up of the curd, blades of tin, three quarters of an inch wide and about the same distance apart, set in a tin

frame 13½ inches square—four rods, one from each corner, meeting in a handle above. The rennet was added to the milk at 84°. The wooden cutter having been used, and as soon as the whey collected above the curd begins to show a greenish tint, the tin cutter is employed to cut fine, used slowly and carefully. The steam is then admitted, carrying the temperature to 88°, the whey drawn off after ten minutes, the curd stirred well, heated to 95°, left standing 20 to 30 minutes, stirred twice, heated to 100°, (or 104°, if steam is admitted around the vat, without any water in the vacancy,) left standing 1½ to 3 hours, and taken out to salt as soon as a very slight acidity can be perceived in the whey. There were, in all, six attendants in charge of this factory.

The Rome Cheese Manufacturing Association, of which Mr. Jesse Williams, the pioneer in the factory system, is superintendent, we also visited. This is a new organization, taking the place of Mr. W.'s old private factory, some of the statistics of the operations of which in previous years, are of interest here. In the season of 1860, 98,801 lbs. of cheese were made, and sold, netting, after deducting the cost of rennet, annatto, salt, bandage and boxes, chargeable to the contributors, $10.654, an average of $10.80 per 100 lbs. for the net returns of the cheese—or 9.8c. per lb. to the farmer, after deducting 1 cent for the factory. In 1859 the price netted by the farmer was 9.9c. per lb. The cheese has been sold for seven years past at an average price of from 10 to 10½c. per lb.

The Manufacture of "Swiss Cheese."

Affording quite a contrast to the foregoing, and carrying one back to the associated dairies of Berne and Freiburg and Vaud, we found at Westernville a factory managed by a Swiss immigrant, Jacob Miller, in strict conformity with the traditions of fatherland. Mr. Geo. Williams, who was our guide here, and through the whole of the journey, very kindly made some farther inquiries, on a subsequent occasion, by the aid of which the following account of the process is rendered more complete than would otherwise have been possible.

Mr. Miller *buys* all the milk he manufactures, paying 8 cts. per wine gallon, and purchasing about 650 gallons per day, the product of 280 cows, delivered by the farmers at the factory immediately after milking. When gaged to ascertain the exact quantity, it is put into copper kettles, holding 170 gallons each, suspended upon cranes, for swinging over and off the fire, in the fireplace. Without cooling to remove the animal heat as in English cheese, the milk is warmed to 90°; swung from the fire, and rennet applied sufficient to produce coagulation in 30 minutes. The curd is next cut to the fineness of one-half wheat kernels, with wire curd cutters; then swung over the fire and gently stirred, and warmed to 130°; swung off, and the stirring continued for 30 minutes; then allowed to stand and settle for 15 minutes, preparatory to removing the curd from the whey. This operation is very

neatly performed by winding one edge of the strainer or pressing cloth two or three times around an unlocked barrel hoop, so pliant as readily and easily to conform to the perfect concave of the kettle; and, by one movement down the side and along the bottom of the kettle, the entire mass of curd is nicely brought within the cloth, and then conveyed to the hoop and press. After pressing four hours, the cheese is submerged in pure water, at a temperature of 60° to 65°, and left about four hours, then placed in press again for two hours, after which they are carried to a cool, dry cellar, placed upon curing shelves, and a light wooden hoop fastened around them, to prevent spreading. Now the first application of salt is made, by sprinkling upon the surface—two ounces to each cheese of 150 lbs., daily, until cured. The cheeses are turned daily, and require from three to six months for curing fit for market. The cheeses are five inches thick, from 28 to 31 inches in circumference, and run from 130 to 150 lbs. weight. Some of this cheese had been sold, we understood, at 16 cts. per lb., but Mr. M. has a contract, by the season, at 14 cents. The day before our visit, 668 wine gallons of milk produced 585 lbs. cheese, and 40 lbs. whey butter. About the end of July, he was receiving 550 gallons milk daily, which yielded him 440 lbs. cheese, and about 30 lbs. butter.

This *Whey Butter* is always made in Switzerland, and is of really very good quality. It is sold readily by Mr. Miller, at perhaps a little more than the average price of common butter; and except for its being somewhat more highly salted than the best butter generally is, the sample we tested had nothing to distinguish it, in color or flavor, from the ordinary product of good butter dairies. At Mr. M.'s factory, the following simple process is employed:

The whey is heated in the copper kettles, after the cheese is removed, gently to boiling heat, which effects the separation of the oily and cheesy particles from the whey, and they rise to the surface and are removed by the skimmer to large tin coolers, which are placed in cisterns of cold water, where the cream remains 24 hours; then it is churned in a common dash churn, worked by dog power, at a temperature of 60° to 65°, requiring about two hours to produce butter. If the cream requires more churning, it generally makes an inferior quality of butter. Mr. Miller says a requisite to good butter is perfectly sweet whey; hence he works up his milk immediately upon delivery, both morning and evening.

Early in the season, before the yield of milk is large enough to make a full sized cheese, morning and night, as above described, Mr. Miller turns his attention to what is called Limburger Cheese—a quite different article. The process of making is the same as that above described, up to the cutting process. It is cut in pieces the size of a cubic inch, and without scalding, molded in nearly the form and size of bricks. When sufficiently hardened to admit, the molds are removed, the cheeses allowed to stand and drain 24 hours; then removed to the salt table, and rolled in fine salt, three times each alternate day, for one week; finally, placed upon curing shelves in the

cellar, turned and well rubbed each alternate day for three weeks, when, if the weather be warm, they are fit for market. Cheese of this kind were made the present year up to June 1st, and sold for 18 cts. per lb.

Quality of Milk at Different Seasons.

It has been mentioned that at the time we visited the factories, in June, 10 lbs. of milk made one of cheese; but it is a well known fact that milk varies in quality at different seasons. Whether this is entirely owing to differences of herbage, or whether it is a provision of Nature, by which the young calf should have a more diluted diet at first, and a stronger one as the season advances, and it is able to digest food of a more condensed kind, we do not undertake to determine; it is certain that the difference exists, and probable that it is wisely ordered. In Butter Dairies, careful observation illustrates this fact very clearly: thus, the experiments conducted by Col. Zadock Pratt, in butter making, as we noted them, in visiting Prattsville in 1861, gave the following results, at different dates, that and the preceding year:

Date of Trial.	1860.		1861.	
	Quarts to Make One Pound of Butter.	Weight in Lbs. per Gallon.	Quarts to Make One Pound of Butter.	Weight in Lbs. per Gallon.
May 1	12.96	7.91	11.20	8.02
June 1	11.48	8.23	12.40	7.74
July 1	12.14	8.30	10.74	8.08
August 1	11.85	8.66	10.45	8.28
September 1	11.83	8.09	9.94	8.12
October 1	9.28	8.53	8.85	8.07
November 1	8.21	7.56	8.50	8.12

This table would have been more instructive if the average character of the milk for several days had been taken, instead of for a single day at each date, when a heavy shower, or some similar cause, might have had a temporary effect upon it.

Mr. George Williams has kept a careful register, in cheese making, for the purpose of testing the same point, and he kindly permitted us to extract the following statement from his books, for the year 1860:

Date.	Quantity of Milk. Wine Gallons.	Quantity of Cheese—Lbs.	Average Proportion for the Six Days—Lbs. per 100 Gallons.
May 15-20	439	398	89.5
June 15-20	764	664	86.9
August 16-21	581	508	87.4
September 15-20	571	517	90.5
October 15-20	545	544	99.8
December 15-20	386	410	106.2

Mr. Williams added an explanation, which should be borne in mind, with reference to these figures: the difference apparently shown by the table,

between the milk of May and June, he thought should be thrown out, as the cheese made in the former month was for immediate use, and was not worked and cooked so thoroughly; consequently, enough more whey may have remained in it to make up the greater weight of cheese then produced, as compared with June. The same explanation he also applied to the figures for October and December; after October the milk, he thought, was nearly uniform, and the December cheese were again for direct consumption, and were therefore not worked as dry; but from June to October the cheese was uniform in character, and the regularly increasing product was solely due to the increased richness of the milk. His investigation of this point had been, he said, of very great practical value to him; unless the cheese be worked and cooked sufficiently to have the whey press out entirely, it is liable to "puff," and to have a strong taste; when, therefore, the 100 gallons of milk ought not to make more than 88 lbs. of cheese, if it is found that the cheese coming from the press weighs 90 lbs. per 100 gallons, the next time it is kept in process longer, and subjected to "another turn of the screw."

We subsequently visited the Dairy of Mr. ALONZO REED, of Danube, Herkimer county, who had investigated this subject for the same reason. His most careful experiment was conducted in 1857, when he was not making so firm an article of cheese as the market at present demands, and the shrinkage was consequently greater than now. The results were:

DATE.	Weight of Cheese cured 30 days, to One Gallon of Milk, Beer Measure—Lb.	Shrinkage of the cheese, during the thirty days.
May	1.08⅛	8 per cent.
June	1.00	10 per cent.
July	1.00	12 per cent.
August	1.10	6 per cent.
September	1.16⅜	8 per cent.
October	1.25	3 per cent.

Quality and Cost of Cheese.

It may here be added that the factories, judging from the five or six we visited, appeared to make a *firmer cheese* than was generally produced in the private dairies of Herkimer, of which we subsequently inspected quite a number, in the towns of Little Falls, Fairfield, Manheim and Danube. While entirely free from any objectionable hardness, the factory cheese would require a longer time to cure, would be less likely to get out of shape or spoil in curing, and would bear exportation better, than any we saw of private make, with perhaps two or three exceptions in dairies of high rank and long experience.

We cannot but think that buyers must give a certain degree of preference to the factory made cheese; since its uniformity is so great that entire dependance can be placed upon the quality of what is purchased. It is per-

haps true that a few of the best private dairies excel the factories, either in the quality of cheese made, or in quantity obtained from a given amount of milk, or in both; but there can be no doubt that in the one respect as well as in the other, the factories *excel the average of the private dairies.*

Considering, moreover, the labor saved in the farmer's family, we cannot see why the same reasoning which relieves the farmer's wife from spinning and weaving the apparel of her husband, to have it done by steam or water power, on a scale of immensely greater extent, should not induce him to send his milk to a factory, to be made into cheese, just as he does his wool to be carded and woven. It gives him greater time to attend to the farm and stock; for his part of the labor, in a cheese dairy, as well as his wife's, although greatly lessened by the introduction of the modern cheese vat, is by no means light. Throwing aside all but pecuniary reasons, however, and supposing that the farmer and his wife are skillful enough in making cheese, and in making sales, to obtain as high a price as the factories do, we have farther to consider the absolute *money cost of the making.* On this subject we consulted Mr. X. A. Willard, who has had long experience as a dairy farmer, and is certainly not liable to be prejudiced in favor of the factories. Not only is there a saving at the factory, by the purchase of salt, bandage, boxes, and all other requisites, at wholesale, but Mr. W. has formed a careful estimate of the cost of the labor involved, together with interest on the expense of cheese house and utensils, in a private dairy, which shows a margin in favor of the factory. For a private dairy, making 20,000 lbs. in the course of the season, he finds the cost of making, at the lowest estimate, to be about 9 mills per lb.; where the amount made is 15,000 lbs., 11 mills per lb.; and for 10,000 lbs., 17 mills per lb. Indeed, Mr. W. stated that the factory cheese generally brings a price enough higher than that of private dairies to fully pay the factory charge for manufacture. How rapidly the new system is making its way in the county of Oneida, will be evident when we state that there are from 30 to 35 factories in operation there the present season, against probably not more than 10 or 15 in 1862.

Private Dairies and Dairy Farming.

The engraving, (fig. 3,) gives an exterior view of a Dairy House, which would probable be large enough for a farm keeping 50 cows. The plan is furnished by Mr. X. A. Willard, and, with the references below, explains itself readily.

Mr. Willard's was one of the first dairy farms we visited in Herkimer county. It includes about 100 acres, and was keeping 25 cows, of which 22 were then in milk. It is an excellent grass farm, and would carry more stock to advantage than the average. His system of cheese making is about the same as that already referred to, described in the last number of the Annual Register, and we consequently shall not repeat it. The dairy house is 26 by 22 feet, well finished, and contained a very fine lot of cheese.

Fig. 3.—Plan of a Dairy House—Perspective view, showing the north end, side, and side openings, with wickets for ventilation.

Mr. Willard averaged 600 lbs. cheese per cow, in 1862, and nearly 650 the previous year, when the season was more favorable.

The average size of dairy farms here is perhaps 150 acres, but we visited several of greater extent. The best carry one cow for every four acres, as

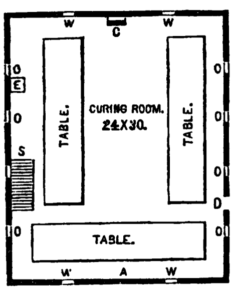


Fig. 4.—Upper Floor.

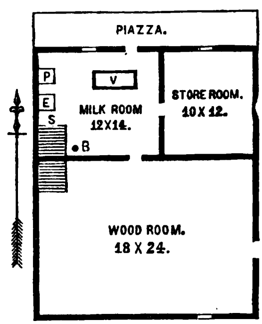


Fig. 5.—Ground Plan.

O, O. Openings with wickets.
C. Chimney.
E. Elevator.
D. Door for delivering Cheese.
A. Alley, three feet wide.
W. Windows.

V. Vat and Heater.
P. Cheese Press.
E. Elevator for carrying Cheese into story above.
S. Stairs.
B. Cistern Pump.

Mr. Willard's does, but others have five acres or more to the cow. Among the farms at which we called, for example, were the following:

Owner.	Size of Farm. Acres.	No. of Cows.	Pounds of Cheese made per day, at time of visit, June 25th—About
X. A. Willard, Little Falls	100	25	78
Elijah Stanton, Little Falls	400	80	—
Abram Keller, Fairfield	250	60	190
J. W. Windecker, Fairfield	190	47	140
Reuben Neeley, Fairfield	200	43	130
W. S. Ford, Fairfield	170	40	130
Josiah Rice, Manheim	280	67	230
Alonzo Reed, Danube	200	50	156
Geo. Williams, Delta, Oneida Co.	170	28	Made at Factory.

Mr. Josiah Rice, one year, made an average of 666 lbs. of cheese per cow, from 40 cows, which is a very large yield. He has been engaged in cheese farming for 30 years, and thinks that during that time he has averaged 400 lbs. per cow, one year with another. His farm affords a favorable example of the true system of carrying on a dairy farm—sufficient attention to manure, and such judicious management that the amount of stock carried may be increased from year to year; he is now keeping 10 or 12 more cows than he did ten years ago. Whether a similar improvement is characteristic of the whole dairy region or not, we should scarcely venture to affirm; it is perhaps safe to say that the number of farmers who *do* thus excel, is constantly, if slowly, increasing.

Protection of Manures.—With the natural advantages possessed by these grass lands, and the large quantity of manure that might be saved, the soil certainly should be growing more productive. The management of the farm, and of manures, does not come within the scope of the present article; but it is not improper to urge that still greater attention might be given, advantageously, to the saving and application of fertilizing material. It is not customary to bed the cows, so far as we ascertained; the manure is consequently almost a pure article, and, if suffered to lie exposed to the action of air and rains a long time before application, with no absorbent material to hold its good qualities, it is evident that its value must suffer very serious diminution. We could not but think that the kind of manure cellar adopted by Mr. Horsfall, in England, and described in the Country Gentleman some time ago, with slatted floors for the cows to stand on, might be advantageously brought into use here, if any where in this country.

Ventilation of Stables.—Beside the importance of preserving more carefully the manures of the farm, one other suggestion occurs, upon the influence of which on the health of the stock—an item fully as important as the productiveness of the fields—too great emphasis can scarcely be placed, viz: the better ventilation of the cow houses. While there are some who are providing for this more carefully, it is still neglected by too many. Abortion among the cows in the dairy district for a few years past has been quite prevalent; and, while the committee of investigation into this subject, on the part of that very useful organization, the "Little Falls Farmers' Club," express the opinion that this difficulty could not be ascribed to lack of ven-

tilation, we cannot but think that the closeness and fœtid odor prevailing in too many cow houses must at least prove a predisposing cause, rendering the animals open to the effects of whatever other causes may exist, intensifying the complaint, and aggravating the likelihood of its farther increase, from sympathy or contagion.

INDIAN CORN AS A FORAGE CROP.—The culture of Indian corn as a forage crop, whenever at least there is any fear of scarcity of pasturage, has extended very greatly within a few years, especially in the county of Oneida, and it is a question whether greater attention to it, even in the most favorable seasons for grass, would not be well rewarded, in the increased number of cows that could be kept. Mr. John G. Webb, whose milk farm of 240 acres, near Utica, we had the pleasure of visiting, raises from 10 to 15 acres per year. We understood both him and Mr. Williams to say, not only that in no other way could so much food be obtained from a given area of land, but also that no other food was better adapted for milch cows. Mr. Webb sows at the rate of three bushels of seed of Western corn per acre, in drills two feet apart, as early as practicable in June—on the 1st, if possible. After turning over old meadow with the plow, and harrowing thoroughly he sows for example, at the lap of every other furrow, using the common Albany drill to put the seed in. He found the cost, in 1862, to be about as follows:

Plowing once, per acre, say	$2.00
Harrowing, per acre, say	1.00
Three bushels of seed	1.87
Sowing and once cultivating	1.50
Cutting and binding	3.00
Hauling to yard, and stooking	2.00
Or, per acre	$11.37

As the yield is from 25 tons per acre upwards, this fodder was stacked in the yard at an outlay of less than 50 cents per ton. As to the system of feeding, Mr. Webb says:—"I feed and milk 66 to 68 cows. They are milked at 4 o'clock, A. M. As soon as milked, a bag of two bushels of 'ships' is fed out to some of the more deserving of the herd. After breakfast, or about 7 o'clock, they are turned out upon after-feed, and kept there about three hours. They fill themselves pretty well, though not sufficiently to lie down generally. At 10 o'clock they are turned into a lot where there is plenty of water, but no feed. At 12 o'clock they go into the stable, where the corn-fodder is already placed in their mangers, in quantity about 20 lbs. per cow. At 2 o'clock they are again milked, and turned out where they just get feed enough to keep them busy till 5 or 6 o'clock, when they are again turned into the stable, where about 40 lbs. per cow, of corn-fodder, has been placed in their mangers."

He estimates that the corn-fodder, thus given out, formed two-thirds of the animals' food, but calling it only one-half, as he found that "67 animals in 23 days consumed 231 square rods of corn, or 10 rods per day for the whole herd, this would be equal to the sixteenth of an acre per day for one-half

the living of 67 cows; or one-eighth acre per day for their entire living; and 108 rods should, at this rate, support a cow in milk 365 days."

It will be noticed that nothing was said of manure in the above statement of the cost of this crop, as it referred to the Mohawk flats, where none was necessary; on upland, an abundance of manure must be used, and besides the cultivation, one hoeing and weeding is given. For winter use, the corn is bound in bundles, and set up in the stack-yard in moderate sized stooks, well bound, consisting of 12 bundles. Mr. W. has fed as late as Feb. 1st, and found it kept well till then. His farm was mainly occupied as follows:

Meadow, for Hay	100 acres.
Meadow, for Soiling	20 acres.
Pasture	25 acres.
Fodder Corn	12 acres.
Barley	18 acres.
Oats	18 acres.
Potatoes	18 acres.
Ruta Bagas	2 acres.

It is his intention hereafter to sow rye for early cutting, after which clover will be in season, followed by Indian corn, as described above, thus supplying green food the season through, and adopting the system of soiling.

Winter Management of Cows.—As a general rule, the feeding of grain is not customary during winter. Some grain is often fed, however, for a short time before and after calving. Mr. Geo. Williams fed Indian corn and oats, ground together in equal proportions, at this time, but thought Indian corn not a healthy feeding material until after the calf is dropped, so that he would feed little if any until then. Some feed grain in summer, but not many; in private dairies, the cows have the whey often to themselves, and it is frequently fed on shorts or bran; where the whey remains at the factories, however, the cows have to do without. As already stated, Mr. Williams raises considerable corn-fodder, sowing it as early as possible, and then at intervals of a fortnight. The effect of this fodder was immediately traceable, he said, in the milk, both as to quality and quantity, but in the former respect more than in the latter.

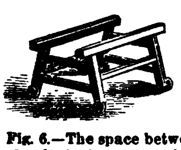
Among our visits was also one at the Utica Lunatic Asylum, whose energetic and accomplished Superintendent, Dr. John P. Gray, devotes great attention to the management of the farm—particularly of the cows, which furnish milk for the six or eight hundred patients he generally has in charge.

Year. Utica Lunatic Asylum.	No. of Cows.	Yield, in Quarts.	Average per Cow—Quarts.
1858	23	63,578	2,764
1859	23	61,921	2,692
1860	31	70,279	2,267
1861	30	72,140	2,405
1862	33	97,320	2,949

We obtained from the steward's records of this Institution, the foregoing figures as to the quantity of milk made, which shows an average annual yield, per cow, we think, very rarely excelled. To arrive at these averages,

however, we take the *whole number of cows kept*, not the average number in milk. Thus, at the time of our visit in June, there were 28 cows on the place, but only 21 of them in milk.

It will be observed that the average yield of milk per cow was raised, in 1862, more than 500 quarts upon the preceding year, and fully 400 quarts upon the average of the four previous years included in the steward's records. This increase was mainly owing to the *cooking by steam* of the winter feed. From early in autumn until green food is plenty, in May, say for full seven months, the following system is adopted:—At about 5 A. M. hay is distributed to them; the stable is then cleaned out. Water warmed by the steam engine of the establishment is brought to the barn, with which the udder is washed previous to milking. They are then milked, and after breakfast receive a little more hay. The steamed food, which forms the next meal, is thus prepared: there are two sheet-iron cans, each containing perhaps 20 bushels; they are filled with roots, scraped to remove the dirt adhering to them, and covered on top with three or four inches deep of meal, the whole depth of the can being 5 feet. Waste steam is admitted at the bottom, and the cooking process continued about 4 hours, or perhaps from 3½ to 4 or 5 hours, the latter if the steam is low. By this time the whole is thoroughly cooked into a pulpy mass. It is then taken out and put into a box on truck wheels, in which it is mixed with about one-third its bulk of middlings and shorts. The shorts are in the proportion of twice the quantity of middlings. After mixing, three-quarters of a bushel of the whole is given per head. The main dependance in roots is the beet, but carrots are also used in considerable quantity; ruta bagas are found to affect the milk. Beets are preferred to carrots, but cows are found to like an occasional change, for the sake of variety. The long blood beet is the variety selected as best. The cows are salted three times a week; but it is common we believe, with many dairy farmers, to keep salt constantly before them. [L. H. T.]



NOTE.—In fig. 6, we give a cut of the car or movable range for turning cheese, referred to at the top of page 91. The size of the car, that is, the length of the upper rails, depends upon the width of the alley between the cheese racks, in which it is to move.

FIG. 6.—The space between the rails will vary with the size of the cheeses—20 inch, 24 inch and 28 inch cheeses requiring respectively 14 inches, 16 inches and 18 inches, between the rails. The height should be ½ inch more than the height of the lower shelf of cheese rack.

EXPORTS OF CHEESE AND BUTTER FROM NEW YORK, SINCE JAN. 1, 1859:

	1859—Lbs.	1860—Lbs.	1861—Lbs.	1862—Lbs.	1862-Value.
Cheese, ...	9,287,000	23,252,000	40,041,000	41,182,109	$3,179,380
Butter, ...	2,494,000	10,987,000	23,159,060	32,003,437	6,118,625

The exports of CHEESE and BUTTER, for the first seven months of the year, to August 1, for this and the two preceding years, were:

	1861—Lbs.	1862—Lbs.	1863—Lbs.
Cheese, ...	14,276,884	14,287,010	16,029,115
Butter.............	7,332,567	10,803,847	7,785,694

COLLECTING AND PRESERVING INSECTS.

Since the publication, in the last Register, of Dr. Fitch's excellent article on Insects Destructive to the Farmer and Gardener, much inquiry has been made for directions for making collections for the cabinet. The substance of the following brief directions have been kindly furnished by W. H. S. Wood, a distinguished Entomologist, of New York—but he is not responsible for all the statements.

Entomologists generally know so thoroughly themselves the first principles, or rather steps, of the science, that they seldom speak of them in writing for the beginner. A simple description, therefore, of the methods of collecting and preserving insects will be found of much use to those wishing to know more of them.

Collecting Insects.—The collector requires few instruments, and these are easily made at home. The most important of them is the hand net, (fig. 2,) which may be made as follows: from a pine board one inch thick cut a strip an inch wide, and from four to eight feet long, (six feet will be found a very useful length;) trim this strip round, tapering it slightly towards the ends, and sand-paper it well, that there may be no danger of running splinters into your hands. This will make a good handle. Now with a piece of stout wire, say about 8-16 inch thick, make a hoop one foot in diameter, and fasten the two ends securely into one end of the pole handle; take strong mosquito netting of any color, though white is preferable, from the facility with which anything may be seen through it, and make a bag two feet long; this must be fastened around the hoop, and completes the net. In using it, the collector creeps stealthily towards the butterfly, for instance, until within striking distance, when the

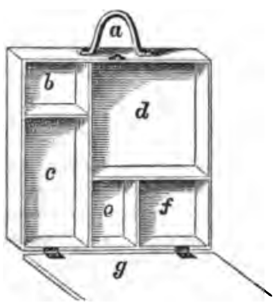


Fig. 1.

Box of Wood for Collecting Insects, 8 inches square, 2 inches deep.

a. Handle, for carrying.
b. Apartment for pins.
c. Place for bottle of alcohol.
d. Envelopes for Butterflies, &c.
e. Bottle of Cyanide of Potash.
f. Place for Beetles, Bugs, &c., on cork.
g. Lid of box, partly shown.

A small padlock must be kept on it, to keep out intruders and meddlers.

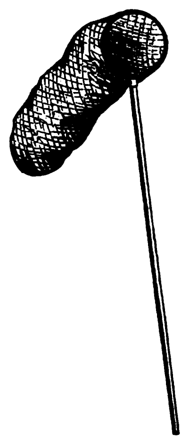


Fig. 2.

Net for Catching Butterflies, about 10 inches or a foot in diameter.

net is carefully and slowly brought as near as prudent, when a sudden dash will, with a little practice, lay the insect in the bottom of the net, a half twist of which will fold the bag over, and closing the mouth prevent it from escaping. There is an excitement in thus warily approaching an insect which has perhaps led you a long chase before it settled, that you have not felt surpassed when with gun and dog you have followed large game. It is really wonderful how sly some butterflies and beetles are. It sometimes seems as if it were almost impossible to get near enough to use the net, and yet, when after a long, cautious chase, we have succeeded in capturing a rare specimen, a feeling, a pleasurable satisfaction, comes, that amply repays the toil. A few pins, prepared expressly for the purpose, with long slender bodies and very small heads, will be found necessary to impale the specimens for preservation, (figs. 3, 4, 5.) Butterflies are pierced through the middle of the

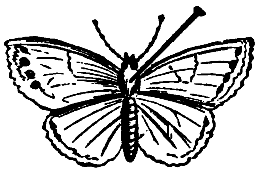


Fig. 3.—Impaled Butterfly, in thorax.

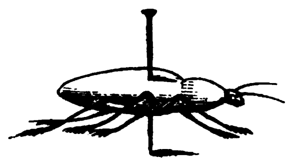


Fig. 4.—Mode of impaling Coleoptera.

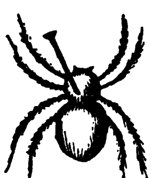


Fig. 5.—Mode of impaling Spiders.

thorax, or just between the wings. Rather generally have the pin through the right elytra or wing case, not far from the connection with the body. Flies, wasps, &c., between the wings. So also with locusts, crickets, darning needles, &c.

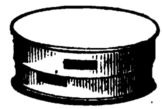


Fig. 6.—Case or box for catching insects, partly open, to show the hole.

The entomologist finds it convenient to carry at all times a small box, divided into small compartments, in which to put beetles that he may chance upon in going about. A good size for this box is, say 3 in. long, an inch wide, one inch deep, with a sliding lid fitted in grooves. The partitions inside should be so fixed that they may be removed, in case a large insect should require place. Some carry pill boxes in nests, (fig. 6.)

Fig. 7.—Very small insect, fastened with gum on paper, set on small piece of cork.

Coleoptera, (beetles, &c.,) Orthoptera, (grasshoppers, locusts, &c.,) Diptera, (flies, gnats, &c.,) may be most easily killed by plunging them into alcohol. If the alcohol is nearly pure, it should be diluted with one-fourth part of water, otherwise, if the insects be left in a day or two, it will injure them. They should be left in

the bottles several hours, or the young collector, who is in too great haste to set his captives out, may be astonished by finding that they have come to life again, having been only stupefied. All insects of the more delicate shades of purple, are best killed by immersion in boiling water, as the spirits are liable to make the color fade; and to this end, when captured, should be placed in one of the boxes which are carried on the field. Many of the smaller butterflies may be killed by a smart pinch in the thorax; a little practice will enable the learner to find the right spot; the large bodied moths and sphinx moths, are more quickly killed as follows: procure at the druggists a small quantity of cyanide of potash, (a deadly poison,) which dissolve in an ounce of water, as much as the water will hold; carry this in the vest pocket when collecting. A pricker should be made, of hard wood, or better of bone, with a sharp point; when a capture is made, this is dipped into the solution and forced into the thorax of the moth, (till it strikes the ganglionic system of nerves, the largest knots of which are in this part of the body;) the poison rapidly circulates, and in a second or two the moth is entirely dead.

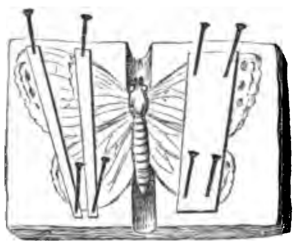


Fig. 8.

Mode of stretching Butterflies on cork, (or soft wood,) while they are yet fresh, with pins and strips of card paper—either two strips, as on the left, or one broad one, as on the right—the pins to be set in the large nerves.

Boxes, or cases, to keep the insects in permanently, may be made of any size—12 by 18 inches are suitable dimensions, and should be made with a close fitting cover; or, if they are double, the two halves should join closely together; such case should be about 2¼ to 2½ inches deep, and should be lined on the bottom with thin strips of cork, which are sold for this purpose, which are 4 inches wide and ½ inch thick; or, what is inferior, with very soft wood, that the pins may not be bent in forcing them in. Many keep their collections in cabinets, containing drawers, which may be of any convenient size, and of the same depth as the boxes. A light placed after dark in a window, and one farther in the room, will frequently draw a large number of insects. Many varieties of crepuscular and nocturnal insects may be caught by washing the trunks of the trees in a grove with the following preparation, applied with a brush: a thick syrup, made of brown sugar, with a small quantity of rum, three to five drops of the essential oil

Fig. 9.

Case for permanently keeping insects, 14 by 22 in., more or less; 2 in. deep, in the clear; lined with cork inside, and with a glass door on hinges. The whole to be hung up on the loop at top.

of bitter almonds improve it, but is not necessary. An hour or so after the application, a visit to the trees will probably be rewarded by finding a number of moths feeding on the intoxicating sweets.

A good trap to catch carrion beetles is to kill a woodchuck or some other small animal, and suspend it to a low branch of some tree that stands out by itself; as soon as it begins to putrify, all varieties of this family will flock to it, and may be shaken out on a newspaper, spread underneath. As many beetles feed only early in the morning, before sunrise, the collector must rise betimes.

There is no branch of Natural History that will afford so much amusement and exciting interest, with as little labor, as entomology; and in an economic point of view, no good farmer can afford to be without the knowledge that some attention to the science will bestow. The day has passed when an observer of even the apparently most trivial objects of Nature is to be looked upon as no better than an overgrown child, and the insect hunter and observer has taken an honorable place in the scientific world. Certainly in no other branch of Natural History than this do we find more wonderful and conclusive evidence of the wisdom and providence of the great God of the Universe, who is equally the Creator of the most gigantic mammals and the microscopic animalculæ, and each have their allotted place to fill in the economy of Nature.

Entomology, or the study of insects, includes the investigation of the four different stages of insect life, namely: the eggs, larvæ or worm, pupa or chrysalis, and the imago or perfect insect. The eggs vary much in shape, being oval, globular, conical, cylindrical, pear-shaped, &c., &c., and are invariably deposited by the unerring instinct of the parent insect where the young larva can find nourishment immediately on being hatched. They are generally smooth, and are of varying colors, white, yellow, orange, pale green predominating, though other colors are found; some have one or more bands of light and dark brown.

When the egg is hatched, the insect appears in a shape in which it is usually called a caterpillar, grub or maggot—in more scientific terms, a larva—and in this stage their main occupation is to eat and grow until the germ of the future perfect insect is complete within them, when they assume the next phase of existence, the pupa state. The pupæ are generally, then, under ground, of varying shades of brown, some highly polished. Those that are found above ground are frequently beautifully ornamented with spots of bright colors, as green, silver and gold. The rudiments of the wings, legs, antennæ, eyes, &c., of the future insect, may be observed with more or less distinctness in the pupa of different species; the chrysalis of some butterflies, for instance, hardly show them at all, while on those of most beetles they are strongly marked and easily recognized. While in this apparently deathlike condition, the final changes to perfection are proceeding, and by a wise provision of nature the continuance of this state is regulated by the

temperature of the atmosphere, so that the development of the perfect insect shall not take place until its food is provided for it, and a suitable provision made for the right deposition of its eggs. After emerging from the chrysalis, the insect lives from a few hours to several months, and it is in this state that they are most frequently noticed, though they are many of them apt to produce a more lasting impression upon the mind of an agriculturist during the time they are larvæ. The imago is the condition in which insects are usually collected for cabinets, &c.

FRUIT CULTURE.

Peaches, Apricots and Nectarines, in Pots or Boxes.

BY P. BARRY, ESQ.

[Many of the readers of the REGISTER are aware that raising fruit trees in pots has recently become an interesting department of fruit culture, and has excited much interest. Among those who have taken the lead, in their economical as well as successful management, ELLWANGER & BARRY, of Rochester, stand conspicuous. Their young trees, loaded with fruit, and without being affected at all by the vicissitudes of the seasons, are admired as highly ornamental objects, by all who have seen them. One of the proprietors has kindly furnished the following clear and condensed statement of their mode of management:]

We have now fruiting, in wooden boxes, 10 by 10 inches, 53 varieties of peaches, 11 varieties of nectarines, and 7 of Apricots.

Age, Potting and Soil. The trees are now three years from the bud. They were taken up in the fall of 1861; heeled in and covered during winter; potted early in spring—March, I think; soil a mixture of about three parts yellow sandy loam, and one part of old hot-bed manure.

Summer Care.—After potting they were kept in a cool house, partly covered with glass, until they had made shoots four or five inches long, and the danger of cold weather over. They were then plunged to the rim of the boxes in an open border until the fall. They were carefully watered when necessary during summer, and the shoots kept as much as possible in uniform vigor, by pinching.

Pruning.—When potted, the yearling trees were cut back to six or eight inches, and in some cases to four inches, or only two or three buds above the union of bud and stock, the object being to grow them in the form of bushes. We now find that those cut back farthest are the best trees.

Wintering.—On the approach of very cold weather, or just before the freezing of the ground so as to prevent out-door work, they were removed to a shed, where they were plunged, as they had been during summmer, up to the edges of the tubs.

Spring Treatment.—On the return of mild spring weather, abundance of air was admitted, and they remained there till 1st May, when they were

placed under glass; the buds at this time being about to expand. Here they were kept till the 15th of June, at which time the fruits were set, and all danger of cold to affect the foliage past.

Ventilation and Watering.—During the period they were under glass, May 1st to June 15th, the principal points of management were VENTILATION, which was ample, and WATERING—the latter being one of the most important points in the treatment of all trees and plants in pots. Careless watering will ruin any plants, no matter how skillfully or carefully other points may be managed. DAILY watering is necessary, and as soon as out of bloom a free use of the syringe night and morning.

Summer Treatment.—On the 15th June, when all danger of cold was over, and the fruits set, they were removed from the glass covering and plunged in an open but sheltered border, and mulched with old hot-bed manure. Since that time they have received no care but watering, except an occasional pinch, to regulate the growth of shoots.

There has not been a single leaf curled on any one of all these trees, showing conclusively that the curl is due to unfavorable changes of weather. Each tree now is a bush about 2½ feet high, and occupies about 3 feet square of space.

The first winter we had potted trees, we kept them in a cellar, but most of the buds dropped, and we changed to the cool dry shed, the boxes plunged, and this has been successful.

The uncertainty of our climate now, as to the peach crop, compelled us to adopt this mode of testing varieties, and we are much pleased with the results thus far. As to amount of labor required, it would not be possible to state it with any degree of precision, as it is made up of odds and ends.

New Pears.

[The following descriptions of two new and valuable pears, were furnished for the REGISTER by CHARLES DOWNING, of Newburgh, who has given them a thorough trial, and whose opinion accords with that of eminent pomologists in other places:]

Doyenné du Comice.—A noble fruit, of great excellence, and will doubtless prove to be one of our best autumn pears. It was raised in the garden of the Committee (*Comice*, Fr.) of the Horticultural Society of Angers, in France. Tree vigorous, upright, young wood light yellowish, a good and rather early bearer, succeeds well both on pear and quince. It is sometimes inclined to drop its fruit before fully ripe. This is distinct from Fondante du Comice, and a better fruit.

Fruit rather large, depressed, pyriform, somewhat pyramidal, inclined, truncate, slightly angular; skin greenish yellow, becoming fine yellow at maturity, often slightly shaded with crimson and fawn in the sun, sometimes with slight nettings and patches of russet, and thickly sprinkled with russet dots; stalk short and stout, inclined, inserted in a shallow cavity, often rus-

seted; calyx small, open or partially closed; segments small, erect; basin large, deep and uneven; flesh white, fine, melting, a little buttery, juicy, with a sweet, rich, refreshing flavor, slightly aromatic; "very good," or "best;" core small; ripe in October and November.

Durandeau or De Tongres.—This fine fruit was raised by M. Durandeau, at the village of Tongres, France. Hence its name, "Durandeau" or "De Tongres." Tree vigorous, bears young and abundantly on the pear. It is said also to succeed well on the quince, but is not yet fully tested. Young wood olive green, brownish in the sun, with numerous gray specks, young branches often crooked or twisting, and sometimes having fruit buds on the present year's growth. The fruit resembles Beurre Bosc, and Paradise d'Automne, except it is broader in form, and the color of a lighter and brighter cinnamon russet, and the flavor fully equal to these well known sorts. It is one of the best of the new sorts.

Fruit large, pyriform, largest diameter near the centre, slightly angular, surface sometimes a little uneven; skin pale yellow, covered with rich cinnamon russet, and often shaded with rich crimson where fully exposed to the sun, and rather thickly sprinkled with russet and brown dots; stalk rather long, moderately stout, inclined, curved, inserted without depression, sometimes by a lip; calyx small, open, or partially closed; segments short, erect; basin rather shallow and uneven; flesh white, fine grained, melting, juicy, with a sprightly vinous, rich saccharine flavor, slightly perfumed; quality "very good," if not "best;" core small; ripe October, November.

Cultivation of Orchards.

In those regions where the land possesses such fertility that trees growing in grass will make annual shoots of two and three feet in length, cultivation of the surface is not necessary. In the Northern States, however, probably no such instances are to be found; and every good manager keeps his young orchard plowed, harrowed or cultivated, clean, or with low, well hoed crops, such as potatoes, beans or carrots. The following interesting experiment is given in the COUNTRY GENTLEMAN, by P. SUTTON, of Lucerne county, Penn.:

I have an orchard containing 50 apple trees, that was set out in the fall of 1857, and has been cropped with potatoes every year except one, when I planted it with beans. The growth has been about two feet each year except last, which was 18 inches. Some of the Baldwin trees had from two and a half to three bushels of apples each, windfalls not included.

One of my distant neighbors bought one hundred trees of the same lot as mine, and set them in a sod, and the consequence is, the trees have not made two feet growth up to this time, and what is worse, a large number of them have died. Last spring I set out ten Rhode Island Greenings. Seven of them were set in a potato patch, and three in sod along the edge of said potato patch. Those set in the sod made from four to six inches growth, the others two feet six inches. I also set some plum trees at the same time, some in sod and some where they have been cultivated. The former made from 4 to 9 inches growth, the latter from 4 to 5 FEET.

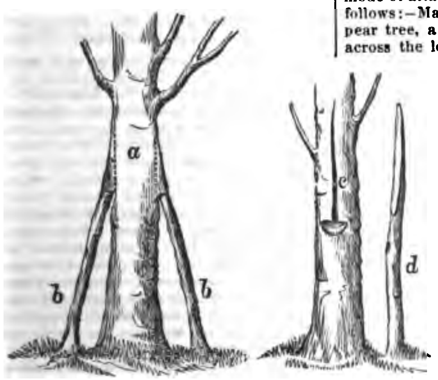
Currant Worm.

This insect has recently proven very destructive in many parts of the country. Various remedies have been employed. Lye strong enough to kill the insects has also killed the currant leaves. A solution of whale oil soap, and other soap suds, have proved efficient in some trials, and in some again have failed. The failures may have been owing to inefficient application. The two remedies that have universally succeeded when properly used, are caustic lime and white hellebore. The lime must be fresh, and then

water-slaked, so as to remain perfectly dry when thus reduced to powder—about one-third of its bulk of water will slake it perfectly. This caustic powder must be dashed freely among the leaves every day or oftener while any insects remain. It is the occasional omission of this work, or the use of old air slaked lime that has led to failure. In using the white hellebore, it is simply dusted over the leaves; and the insects, in eating them, swallow more poison than they bargain for. The rain washes it all off before the currants ripen.

Dwarf Pears Changed to Standards.

It often happens that dwarf pears lose their vigor after bearing a few years, and many kinds live but a short time under the best management. So long, however, as they bear much earlier than standards, their cultivation will be continued, in spite of this formidable disadvantage. To combine the advantages of both—by changing the dwarf, as soon as its energies flag, to a standard, and thus secure its growth and productiveness for a century—has long been a desideratum. To accomplish this purpose, some pomologists have recommended the practice of planting the dwarf so deep that the place of union between the pear and quince may be some inches below the surface of the earth, that the pear may throw out roots for itself.



a. Trunk of Dwarf Pear Tree. b. b. Pear Stocks inserted into it, for new bottom. c. Cut for receiving the Pear Stock. d. Pear Stock, cut sloping before insertion.

This is, however, attended with objections. If the pear does not root while the tree is yet young and thrifty, and when it is most desirable to retain the character of the dwarf, it will not often root at all. Besides, but few roots are thus thrown out, and frequently on one side of the stem, so that the tree is unequally supported, and it often lops over or becomes prostrate.

The following mode of effecting the desired object has been successfully adopted by James Oliver of Lynn, Mass.:

He allows the dwarfs to grow and bear, until symptoms of decline make their appearance. Two thrifty pear seedlings or stocks are then planted on each side of the trunk, and as near to it as practicable—within an inch or two, if possible. No harm will be done if some of the quince roots should happen to be cut in setting them. They grow one year. Then, the next spring, as soon as the bark will peel, they are inarched into the pear tree. A new bottom is thus formed for the pear tree, and new vigor is soon imparted to it. A substantial two-legged tree is thus manufactured, and the quince ceases to perform its office. The mode of attaching the stocks to the tree is as follows:—Make a slit in the bark of the dwarf pear tree, a few inches above ground, and across the lower end of the slit, make a cross cut, so as to form an inverted ⊥. If the tree is large, make a notch instead of the cut, sloping downwards, so as the better to admit the stock. Then bend the stock against this notch or cross cut, and mark it at that point. Then with a knife set with the edge upwards at this mark, cut the stock off with a slope two or three inches long. It is then easily bent and inserted into the slit. It may be covered with grafting wax, but grafting clay is much better for this purpose. This is made of clay or clay-loam one part, and horse manure two parts, well mixed together—the addition of a little hair is an improvement. Cow manure is entirely unfit, being too compact with the clay, and not possessing the fibrous character of the other.

Dwarf pears that had nearly ceased growing, have been restored to vigor in this way.

Cultivation of Small Fruits.

As a general rule, give the soil the same manuring that is required for the best corn crop. Strawberries and blackberries may not need quite so much as the raspberry. Good, well rotted stable manure or compost, will be best. The only preparation of soil is

good fine pulverization, by plowing and harrowing—if subsoiled or trench plowed, all the better, especially for the raspberry.

The best market sorts of the strawberry are Wilson's Albany, and Triomphe de Gand. The Fillmore is thought by some to give high promise of value. In some places Hovey's is profitable. Early Scarlet and Jenny Lind are good early sorts, but less profitable. Strawberries with the very best culture and management will yield two or three hundred bushels per acre, but half this is the more common crop. The profits depend entirely on the market, and skill in management—say $300 per acre, if well managed. The best market Blackberry is the Rochelle, (miscalled Lawton,) which at its best has borne two hundred bushels per acre. The Doolittle, Hudson River Antwerp, and Franconia, are the best raspberries—they will yield half as much as the Rochelle Blackberry, but sell higher. Cultivation by a horse is best for all these, and by far the cheapest—it need not cost much more per acre. It is essential for the success of the blackberry that new summer canes be pinched in when three or four feet high, to prevent a long straggling growth, keep the plants snug and compact, and promote fruitfulness. It is hard to say what the profits per acre will be for these different fruits, or which is most profitable, as so much depends on market and management. Pardee on the Strawberry, published by Saxton, and the first volume of RURAL AFFAIRS, contain much that is valuable on small fruits.

Fruit for the Army.

The observation has often been made, that those who emigrate to the West, and take care to provide a regular supply of good fruit for themselves and their families, by planting strawberries, gooseberries, and other quickly bearing sorts, suffer much less from fevers and other maladies of new countries. The best medicine chest, therefore, that a western emigrant could take with him, is a large box filled with strawberry, gooseberry, currant and raspberry plants, dwarf apples and pears, and such standard sorts as bear quickly, such as the Dyer apple, Oldenburgh, Baldwin, &c., and Bartlett, Julienne, Howell, Washington, and other early bearing pears. There is no doubt that the use of fruit, regularly supplied to the soldiers of the army, would prevent a vast amount of sickness and suffering. Fresh fruit could not be always easily supplied; but dried fruit properly cooked would be a good substitute. The utter prohibition of all whisky rations, boiling all the water before drinking it where it is not perfectly pure, and adding a little fruit to the daily food, would nearly prevent sickness in the army.

Improvement in Culture.

A few years ago, about one hundredth part of all the fruit trees and small fruits set out, were sufficiently cultivated, and resulted in success. Necessity has created an improvement, and there is more and better cultivation now than formerly. Purchasers of trees heard the favorable stories of great success and high profits, and thought that all they had to do, to be equally successful, was merely to purchase and plant the trees. Entirely failing, through total neglect of culture, they pronounced "all these stories humbugs." Nurserymen soon found that the greatest obstacle in the way of extensive planting, was neglected cultivation—for no one can be expected to purchase trees, when he sees every one fail. Renewed efforts were therefore made, to introduce better management, and they are slowly succeeding.

Management of the Bare Stems of Trees and Watering.

It is familiar to horticulturists and physiologists, that as long as trees continue in a state of vigorous growth, they keep cool, or maintain a low temperature in every part. An apple, while growing on the tree, or remaining attached to the branch after maturity, will not become heated, with the severest rays of summer pouring upon it. When it is severed and falls to the ground, it soon becomes hot in the sun's rays. It is so with the stem or trunk of a tree. If there is a free growth, the bark is rarely injured by heat; if the tree has been checked, or rendered nearly dormant by previous transplanting, or by neglect in cultivation, the danger from this cause is greatly increased. We frequently see half dormant trees with burnt and peeling bark on the south side, after a hot summer. The remedy for this evil is good cultivation in the first place, and if this is insufficient, shading the stems by tying on a loose covering of straw, and if but few leaves have come out, keeping this straw wet by occasional applications of water. Transplanted trees sometimes remain green many weeks without expanding their leaves, and they are often injured in this condition by soaking the roots and leaving the stem too dry. Roots need a copious supply of moisture only when they have plenty of leaves to throw it off and pump it up from below.

Many newly set trees are killed by injudicious watering; the water is poured on the surface, and first wets and then hardens it, and renders it worse than before. If any

watering is given, the soil should be first taken off the roots, that it may pass freely among them, and then the mellow earth is to be replaced. But even this must afford but an irregular supply, and cannot be so good as the constant and uniform supply furnished by a well cultivated, mellow soil, or by a well mulched surface. In conclusion, our readers who may have planted out CHERRY TREES the past spring, may properly be reminded that there is nothing that will more certainly secure them from the mid-summer death to which they are so liable in hot seasons, even after making two or three inches growth, as a thick heavy mulching of old straw, hay, or sawdust, extending several feet about the tree; and in the more doubtful cases, it may be best to straw the whole stem, and keep this daily watered for a time. At the same time surface watering for such trees is positively detrimental; in proof of which we may mention a single instance out of many. A neighbor set out 50 fine cherry trees—he watered 25 and left 25 unwatered. Of the former, one-half died; of the latter, but two out of the whole. A good mulch would probably have saved all.

Peaches for Market.

At a late meeting of the Fruit Growers' Society, at Rochester, H. N. Langworthy said that more money could be made on late peaches than on very early ones—that they could be more safely marketed, and sent to longer distances without loss. The best very early sort was Serrate Early York—next Crawford's Early, which he thought the most valuable of all peaches. The George IV, Large Early York, Kensington, &c., had ceased to bear well; the crops were killed, and they had become unreliable. The best substitute for all these is Cooledge's Favorite. The next, a rather late sort, is Oldmixon Freestone, but of late it has become unreliable as a bearer. The Late Crawford, an excellent fruit, has nearly ceased bearing; has run out in this climate.

E. Moody agreed with Langworthy in some sorts, but would like to show him his Late Crawfords—they are very large and fine—he had lately measured a peach that was ten and a half inches in circumference. He would plant at least one-half of an orchard with Late Crawford, although usually a moderate bearer. With most kinds, a great error is committed by not sufficiently thinning out the fruit—the trees are injured when allowed to overbear, and the fruit is far inferior in quality. The present year he had received a dollar and a half for his thinned peaches, while a neighbor, without thinning, received only from 37½ to 50 cents—one-fourth to one-third—while the amount of the crop was about the same in both cases. The thinned and large peaches could be picked in far less time—one man had picked eighty baskets of peaches in a day. He manures only as the trees advance in age. He thinks after trees have borne three years it is best to pull them up and plant new.

Difference between Good and Bad Fruit.

These two practices—GOOD CULTIVATION and THINNING THE CROP—are the foundation of the difference between such superb and magnificent specimens of the pear as graced the extended tables, and densely filled the vast Hall occupied by the Massachusetts Horticultural Society, and such miserable fruit as we sometimes see borne on the grass-grown, weed-choked, mice-gnawed, sickly-leaved, forsaken trees on the slipshod farmer's grounds—planted out with hardly the expectation, but rather with a sort of dim hope that they would grow and take care wholly of themselves.

One of the best things that a horticultural or pomological society could do, would be to place conspicuously on exhibition a collection of such splendid fruit as might be raised under all the favorable influences of good culture and judicious thinning; and another collection beside it, with all the marks of small size and scabbiness which might be expected from utter neglect. One collection should be marked, "Fruit raised under the eye of industry and vigilance," and the other labeled, "Fruit allowed to raise itself."

Pruning should not be omitted as an important requisite, but so far as its influence on the fruit is concerned, it comes under the same head as thinning, and is indeed a useful auxiliary to the latter. A peach tree may generally have its fruit readily and easily thinned by cutting back; and an apple tree that is pruned at the top by thinning in from the outside, (instead of trimming and thinning up from below, and leaving the outside as thick as ever,) may have the proper number of specimens easily controlled.

Orchardists have got to take hold of this matter. Orchards are increasing in number, competition will arise, purchasers are improving in discrimination, and will not be satisfied to pay much for poor stuff. Shrewd orchardists, who know how to secure a permanent demand for their products, as well as to obtain the highest prices, will be first to adopt these modes of manufacturing the finest article, and unless others fall in they will be left in the lurch. The next twenty years, if the world moves on as it has done, will

witness an astonishing education in the masses, in a knowledge of excellent fruit, and in the discrimination between a poor and a fine article. If they can be supplied with the latter, they will buy and consume; if nothing but the former can be had, they will reject it with disdain. This will become true to a great extent, sooner or later, and and the raisers of fruit for market must trim their sails accordingly.

Planting Dwarf Trees.

We have been favored by a young correspondent with the following description of the best mode we have met with, for setting out a dwarf pear orchard. He has set out many thousand trees in this way, and we can bear witness to the mathematical accuracy of the rows in his own orchard. The rapidity of this mode of planting strongly recommends it—three men planting four hundred trees on an average, per day, in the best manner:

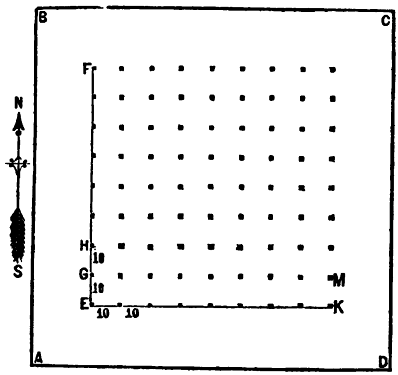


Fig. 3.—Plan for Dwarf Pear Orchard.

A rapid and accurate method of planting dwarf trees, so that an observer, looking in any direction from the centre of the orchard, may find the trees exactly in line with each other, would perhaps be of value to some of your readers. The superior neatness of such a style of plant'ng is its sufficient recommendation, to say nothing of the consequent facility of cultivation east and west, as well as north and south. As "the books" seem to have left orchardists to engineer this matter for themselves, I offer the accompanying plan, (fig 3.) which has been found to work well in my own experience.

Suppose A, B, C, D, to represent a field which has been enriched and properly prepared by deep plowing and repeated dragging, and is to be planted with dwarf pear trees, ten feet apart. Provide yourself with a line and a light pole twenty feet long, notched in the middle. Plant a tree at the point E, equi-distant from the fences A, B, and A, D. Stretch your line from E to F, parallel to the fence A, B. Having taken your place on the east side of the line, while your attendant stands ready with his spade on the west side, lay your pole along the line and about two inches east of it, placing the south end at the point E. The notch in the middle will show your assistant where to make the hole, and a little care will enable him to dig under the line, so far as may be necessary, without disturbing it. When the hole is large enough, set the tree at the point G, against the west side of the line and opposite the notch.

Plant a tree at H, at the end of the pole, in a similar manner. Then carefully notice the exact spot, ON THE GROUND, to which the north end of the pole corresponds. Take up the pole and shift it twenty feet northward, placing the hinder end of it precisely where the front end was before. You thus have the places determined for planting two more trees.

When the row E, F, is finished, plant the row E, K, in a similar way, being careful to place all the trees on the south side of the line, for convenience of shifting it.

Having reached the point K, move your hoe ten feet north, placing the west end of it against the north side of the tree at G. Then measure eastward from the tree at G, and plant the row G, M, placing the trees as before on the south side of the line.

Each row is thus to be planted by measurements from the base line E, F. With care in measuring, the trees will be found to row in any direction. The time occupied in shifting the pole along is much less than that which is consumed by the ordinary method of ranging from stakes.

Vineyards too Fertile.

The corresponding editor of the Rural New Yorker visited a vineyard in Onondaga county, N. Y., planted on a hillside, with a rich soil at the bottom, poorer at the top. At the bottom the growth of the foliage was rank and green, with little fruit—at the top, less growth and foliage, but plenty of fruit. Vineyard men in this country have mostly adopted the opinion, that soil of moderate

fertility, made deep and kept constantly mellow, is best for native grapes—and that animal matter and heavy manuring are suited only for the borders of grape houses. Fertility is, however, comparative; and there may be places where no soil is rich enough without manure; and others again too rich, such for example as the most fertile alluvions, and hills are to be sought in such places.

Popular Pears at Boston.

At the recent magnificent show of the Massachusetts Horticultural Society, one of the most conspicuous parts of the exhibition was the dishes of large and admirably grown specimens of pears. To show what sorts stand high in favor in that region, we name some of the most prominent varieties we observed there in different collections:

New Sorts.—De Tongres or Durandeau, Meriam, Doyenne du Comice, Beurre Bachelier, Kingsessing, Sheldon, Beurre Hardy, Beurre Superfin, Moore's, &c.

Older Sorts.—Belle Lucrative, Louise Bonne of Jersey, Anjou, Bosc, Bartlett, Onondaga, Boussock, Urbaniste, Pratt, Angouleme, Howell, Flemish Beauty, Marie Louise, Winter Nelis, Langelier, Diel, Easter, Seckel, Andrews, Dix, Glout Morceau, Clairgeau, Lawrence, &c.

List of Pears.

We observe in the public papers the following list of pears recommended on the authority of Charles Downing of Newburgh, comprising 18 sorts, for an amateur collection of 100 trees. The only alteration we have made is in arranging them nearly in the order of ripening:

2 Doyenne d'Ete, 2 Dearborn, 6 Rostiezer, 4 Brandywine, 6 Bartlett, 3 Seckel, 5 Flemish Beauty, 10 Beurre d'Anjou, 4 Belle Lucrative, 10 Beurre Bosc, 5 Paradise d'Automne, 5 Henkel, 4 Beurre Superfin, 6 De Tongres or Durandeau, 6 Sheldon, 3 Winkfield, 10 Lawrence, 4 Beurre Gris d'Hiver Nouveau.

Some will insist on adding Giffard and Tyson as summer sorts; Boussock, Louise Bonne of Jersey, and Urbaniste, for autumn; and Glout Morceau, Winter Nelis, and Alencon, for winter.

Old Apple Orchards.

A writer in the New England Farmer gives the following account of his experience in renovating old orchards: "I have had two farms with two old orchards where the trees were on the decline. One of them I plowed and trimmed off the old and decayed branches, and left the young sprouts to grow, and in the course of six years I had some quite thrifty trees. On the last farm I have adopted another course—that is, I have put in hogs through the spring, summer and fall, and I find a saving in expense in keeping, and the advantage to my trees far greater than any thing I could do with the plow. They not only dig round the roots of the trees, but eat the apples that drop, and destroy the worms."

Crops of Fruit.

The Boston Cultivator says that Dr. Jabes Fisher of Fitchburg, Mass., gave up the practice of medicine and began to plant orchards about nine years ago, and his orchards have mostly come into bearing. He has planted 1,050 pear trees, two-thirds of which are dwarfs; 200 apple trees; and many peach, plum and cherry trees. He had this year about 25 barrels of pears, and 130 barrels of apples. If all had borne as well as the Hubbardston Nonsuch or Minister, he would have had 400 barrels. He finds it better to make apples into cider for vinegar than to sell them less than 75 cents per barrel; four barrels of cider make three barrels of vinegar, which brings $4 to $5 per barrel.

Apples for the West.

W. C. Flagg gives the result of the votes or opinions of fifteen intelligent fruit culturers, in different parts of Missouri, Illinois, Indiana and Southern Ohio, and makes out the following average list:

Early Harvest,	8
Carolina Red June,	8
Early Strawberry,	8
Sine-qua-non,	8
Kirkbridge White,	7
Summer Queen,	7
Rambo,	6 or 7
Pennsylvania Red Streak,	8
Yellow Bellflower,	8
Pryor's Red,	7
Newtown Pippin,	6 or 7
Rawle's Janet,	10
Gilpin,	8

Grafting on Dissimilar Stocks.

Grafts or buds, in order to succeed, must be placed upon stocks of some similarity. An apple will never grow on a peach, nor a peach or a cherry on a thorn. The latter, although it has stony seeds, is much more nearly allied to the pear in other respects than the peach, plum or cherry. Success cannot always be determined until trial is made; for instance, the pear in some of its varieties will grow well on the quince, altho' of a different genera, while other varieties

will not grow at all. The peach and plum, also of different genera, grow mutually on each other. On the other hand, some species of the cherry fail entirely on others, although of the same genus. Experiment must decide such questions.

Select List of Small Fruits.

The following lists were voted for by prominent members of the Fruit Growers' Society at Rochester, at the summer meeting in 1863, and they show the estimation in which these fruits are held in Western New York:

CHERRIES.	Votes.
Gov. Wood,	13
May Duke,	11
Black Tartarian,	11
Yellow Spanish,	10
Reine Hortense,	10
Early Purple Guigne,	10
Coe's Transparent,	8
Black Eagle,	8
Belle d'Orleans,	7
Bigareau de Wezel,	6
Napoleon Bigarreau,	6
Knight's Early Black,	5
Late Duke,	5
Early Richmond,	5
Holland Bigarreau,	4
Rockport Bigarreau,	4
Elkhorn,	4
Elton,	4
English Morello,	3
Great Bigarreau,	3
Black Hawk,	3
Tradescant Black Heart,	2
Downer's Red,	2
Belle Magnifique,	2
Burr's Seedling,	1
Carnation,	1
Sparhawk's Honey,	1
Chinese Bigarreau,	1
Turkish Bigarreau,	1
White Heart,	1
Champaigne,	1
Delicate,	1
Kirtland's Mary,	1
Elliot's Favorite,	1
American Heart,	1

RASPBERRIES.	Votes.
Franconia,	5
Brinckle's Orange,	5
Red Antwerp, or Hudson River Antwerp,	5
Fastolf,	4
Best for Market,	4
Doolittle's Black,	4
Orange,	3
Vice-President French,	2
Fillbasket,	2
Northumberland,	2
Purple Cane, or Red Prolific,	1
Hornet,	1
Belle de Fontenay,	1
Merville de Four Seasons,	1
Knevet's Giant,	1

CURRANTS.	Votes.
White Grape,	6
Cherry,	5
May's Victoria,	4
Red Dutch,	2
Black Naples,	2
Champaigne,	1
Versaillaise,	3
Fertile d'Angers,	1
White Dutch,	1

Winter Apples for Family Use.

At the winter meeting of the Fruit Grower's Sociery, at Rochester, the following votes were taken on some of the leading sorts:

Rhode Island Greening—Unanimous.

Baldwin—Unanimous.

Esopus Spitzenberg—Objected to, on account of liability to spot, unhealthiness, and occasional unproductiveness—8 votes for, 10 against.

Red Canada—12 for, 1 against.

Northern Spy—Considered the best table apple, when well grown—16 for, none against.

Twenty Ounce—14 for, none opposed—(Cooking.)

Tallman Sweet—15 for, none against—(Baking.)

Tompkins Co. King—14 for, none opposed.

Peck's Pleasant—9 for, 2 against.

Fameuse—Objected to, on account of its imperfection in growth—quality good—9 for, 13 against.

Wagener—Overbears; keeps well; none better—15 for, none against.

Fall Pippin—Spare bearer—6 for, 8 against.

Pomme Gris—Much conflicting opinion—9 for, 4 against.

Hubbartson Nonsuch—4 for, 5 against.

Yellow Bell Flower—2 for, 8 against.

Melon Apple—7 for, none against.

Swaar—4 for, 8 against.

Green Sweeting—10 for, 1 against.

Golden Russet—11 for, none against.

To Prolong Flowering.

In order to prolong the flowering season in perpetual and other roses, and in annual and perennial plants, clip off with a pair of scissors the seed-vessels, as soon as the petals fall. This prevents the exhaustion of the plant in the forming of seed, continues its vigor, and preserves a neater appearance of the whole plant. At the same time, the use of the scissors will enable the gardener to impart a symmetrical form to the plants.

DOMESTIC ECONOMY.

Preserving Fresh Fruit in Cans and Jars.

There are several modes of preserving fruit beyond the ordinary season of its ripening. The simplest is selecting long keeping varieties, and merely placing them away in a cool, dry apartment, on shelves, in boxes or drawers, or in tight barrels. This course, variously modified, is pursued with apples, winter pears, and with grapes. Another way is the old fashioned, now nearly discarded, mode of preserving in sugar, pound for pound. A third, and in some respects the best mode, is drying the fruit; if rich, high flavored sorts are selected, and the drying rapidly performed, in well ventilated rooms, the result is excellent; but poor fruit, half decayed in the process, never repays the trouble. The fourth mode—that which claims our particular attention at the present moment—is preserving in air-tight cans or jars. For this purpose but little sugar is needed, or no more than to impart an agreeable flavor, and it is therefore well adapted to the present high price of the article.

There are many modifications of the process. The long and minute directions sometimes given, without pointing out the main and essential requisites, have rather served to bewilder than assist the beginner. All that is absolutely necessary is to select good fruit, to heat or cook it, and inclose it in airtight cases, without any air bubbles or interstices. If kept in a cool place, it will remain for months without injury.

PARTICULAR DIRECTIONS.

Quality of Fruit.—It is important that the fruit be well grown and well ripened, as it then contains more and richer juice for preservation. Small, half green, imperfect, or half decayed specimens, should be rejected.

Jars or Cans.—The tin cans, formerly in general use, are now mostly discarded. The acid of the fruit is apt to dissolve the metal, and produce a poisonous compound, and the condition of the fruit cannot be inspected with the eye. Glass jars are now generally employed—earthen succeeds equally well, and is somewhat cheaper, but the fruit cannot be seen. A large number of patent covers have been invented, possessing various degrees of merit. They may be divided into three classes—those consisting of cork; those made of metal or glass, with cement lining; and those with India rubber lining. The objection to cork is its porosity, requiring a large amount of cement, through which the air pressing is apt to impart its flavor to the fruit. The India rubber linings are the most convenient and easily applied; but they should be well made, and form a perfect fit; many that have been offered in market not being tight, have caused the spoiling of the fruit. Different modes are employed to remove the covers in taking out the fruit. The corks should have two small and strong cords placed under them, for lifting them out, the ends of which should be well covered with cement, to prevent the admission of air, or a round piece of cotton cloth may be used for the same purpose. Pincers may be used for drawing the cord or cloth in taking the covers off. The covers may be loosened with the India rubber lining, by inserting the point of a knife.

The annexed figures represent one of the simplest modes of applying the India rubber lining. A ring of this material, about ¼ in. wide, and ⅛ in. thick, is placed in a groove or depression outside the neck, as shown in

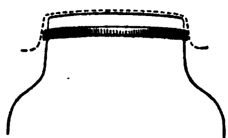


Fig. 1.—Top of Jar, with India Rubber Band; Place of Tin Cap, shown by dotted line.

fig. 1. A tin cap is then applied, which fits closely, and presses against the outside of the band. The upper edge of the jar is ground,

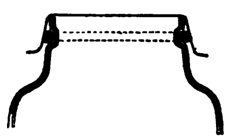


Fig. 2.—Section of Top of Jar, with India Rubber Band; Place of India Rubber shown by dotted line.

so that the tin cover rests flat upon it. Fig. 2 is a section of this arrangement.

Heating the Fruit.—The fruit should be heated to nearly or about the boiling point of water, but should not be made to stew or boil, as this would break the form of each specimen, and reduce the whole to a mass.

For common family purposes, the best way is to place the fruit in a tin pan, with about as much sugar as will give it a proper flavor, and then set the pan in the top of a stove boiler, where it will fit as a lid; then let the water boil beneath the fruit until the whole is well heated through. Small fruits require less time than large ones. About 15 minutes will be needed for strawberries and raspberries; 20 minutes for cherries, currants, peaches and plums, and half an hour for apples, pears and quinces.

Filling Jars.—While the heating of the fruit is going on, place three or more empty jars in another boiler, and pour in cold or moderately warm water till it rises nearly to their necks. A heavy weight, as bricks, flat irons, or flat stones, must be placed on these jars, to hold them down; and it is safest to place a few small strips of wood on the bottom of the boiler, before setting the jars in, to prevent their cracking by the heat below. When the water about the jars has nearly reached boiling, they then may be filled with the fruit by means of a dipper. This work is facilitated by providing a wide tin funnel, (fig. 3,) made on purpose to fit the mouth of

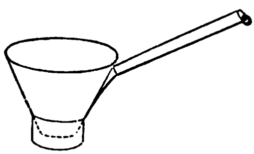


Fig. 3.—Funnel for filling Fruit Jars, with a rim set on below, to fit the outside of the neck.

the jar, and it should have a handle a foot long, to prevent any danger of burning or scalding the hand. When the jars are full, the contents should be slightly shaken, to start up any air bubbles that may remain, and the water allowed to boil slightly about them for a few minutes. The covers should be then applied, and made air-tight, at the same moment the jars are withdrawn from the water. Before applying the cover, the jars should be so completely filled with fruit, that not the least air or space may remain, but the whole be perfectly solid.

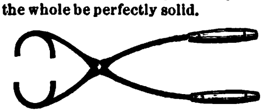


Fig. 4.—Pincers for Lifting Jars from hot water.

To save the hands from scalding, there should be a pair of forceps (fig. 4) made to fit the neck of each jar, to grasp it readily in lifting it from the hot water.

The juice of all small fruits furnishes sufficient syrup with the sugar to fill all the interstices; but some larger and drier sorts require sometimes the addition of a portion of syrup made by boiling a pound or two of sugar in a quart of water.

Some persons, after having heated the jars, fill them while they are standing on a table, and then replace them, and continue the boiling for a few minutes, or until every air bubble has passed from them, before sealing them tight. Either way will answer, if the work is well done.

Cement.—The best is made of one part of tallow mixed with about ten or twelve parts of rosin. An increase of the tallow softens the cement. The most perfect India rubber linings obviously need no cement; with corks it must be used freely, and is indispensable. The best mode is the following, described in the American Agriculturist:

Small tin saucers, or "patty pans," are procured, an inch more in diameter than the mouth of the jar—these may be obtained cheaply, by the quantity, of any tinman.

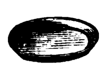


Fig. 5.

Tin Saucer, for covering top of jar.

When the jar is filled with fruit, the cork is crowded snugly in, and a coating of cement is placed on the top. A portion of the melted cement is then poured into one of the tin saucers, and the mouth of the jar inverted, placed in it—forming, as soon as cool, a perfect air-tight cover, the saucer remaining until the fruit is taken out of the jars. Common tea saucers, and even blacking boxes may be used, instead of tin saucers.

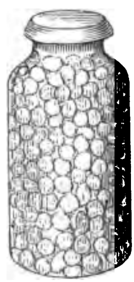


Fig 6.—Fruit Jar, filled and covered with Saucer.

Quantity of Sugar Required.—Some have stated that they succeed in keeping the fruit without using any sugar; but in ordinary practice it is safer to apply it, and it is best to do so at once, rather than to defer it till the fruit is used. Strawberries, peaches, pine apples and quinces, require but a small quantity, five ounces to a quart of fruit being sufficient. Cherries, plums, raspberries and blackberries, require more, or seven to eight ounces.

Stone Jars.—In the absence of common jars, which could not be procured, a friend

employed two gallon stone jars, with entire success. They were filled as already described, the fruit running out all around as the lid was applied, so as to prevent any vacancy or air, and the whole well cemented. After several months, they opened in perfect condition.

TOMATOES.—These preserve the easiest of all ripe fruits. They may be kept entire after merely removing the skin; or, what perhaps is better, as well as more economical, stewed down to about one-half of their original bulk, as they are a very watery fruit.

Strawberries need but few minutes cooking; cherries a greater length of time; peaches still longer, and should be well done.

In order to determine whether the fruit has been well put up, in India rubber lined jars, lift them by the covers, or apply a few pounds force to them. If the cover comes off, the work has not been well done—some air has been allowed to remain, or the heating has been insufficient, in which case the boiling must be done over again. It is safest to examine them a second time, in about a week.

It is important that the fruit jars, after the whole process is completed, be placed in a cool and rather dry place. If the temperature is warm, they may spoil by fermentation; and experience has fully proved that they mold in a damp cellar. If the temperature were but a few degrees above freezing, they would probably keep uninjured for years. There is no doubt that an excellent apartment should sometimes have the credit which is ascribed to a particular mode of putting up.

Glass jars should be kept in a dark place, to exclude light.

Wash for Barns.

There is no cheap substitute for oil paint. All the different kinds of whitewashing are incapable of shutting out moisture. The The sides of buildings especially exposed to rains, will lose a portion of any kind of wash by the combined action of frost and moisture. Oil paint obviates this difficulty.

There are many different kinds of wash recommended; but with a single exception we have never found any thing better than a mixture of good lime with water. This exception we have made a thorough trial with. A rough barn, which received a coating four years ago, now retains most of it, although a considerable portion is scaled off on the most exposed side. This wash is made substantially as follows:—One peck of fine beach sand, three pecks of water lime, and four quarts of salt. These proportions might vary without detriment—there should be as much sand as can be conveniently applied with a brush. A farm laborer applied this mixture early last summer to two rough barns, one about 30 by 55 feet, the other 20 by 30, in three and a half days, consuming two bushels of water lime, which was nearly the whole cost of material. This coating, now nearly one year's standing, appears to be as good as the day it was put on. It will be perceived that the expense is only about one-tenth the cost of a coat of paint.

A House to Dry Fruit in.

In many sections of the country there is an abundant fruit crop; much of this fruit cannot be sent to market, to profit, in its green state, and may be dried to good advantage, and find a ready sale at high prices. While tne war lasts, there will be an unusual demand for dried fruit. The usual methods employed for drying fruit are slow and tedious. In Kentucky and Tennessee, where apples and peaches are extensively dried, they have a cheap method of building kilns for the purpose. These are built of the common limestone of the country. A furnace or fireplace is made, about two feet wide and six feet long, terminating with a low chimney at the opposite end. The walls are laid up about eighteen or twenty inches high, and and then covered over with thin slabs of limestone, and the whole made smooth with a coat of mortar. Upon this the fruit is dried. A rough shed is built over the kiln, so that the work can progress in rainy weather. This method of drying fruit, however, is objectionable; exposed to the air, it dries slow, and even with the greatest precaution the fruit is often burned on one side over the hottest portion of the furnace.

At the Shaker establishments in Kentucky, they have a method of drying fruit that is both expeditious and very complete. It consists of a building of logs, brick or stone, of any convenient size—say ten feet wide by twelve or fourteen feet long: the walls seven or eight feet high, with an ordinary roof. Upon the top of this should be a ventilator, sufficiently large to admit of the escape of the vapor arising from the fruit. An opening may be left along under the eaves for ventilation, but it is better to have it on the top of the building. At one end of the house a furnace is built, opening on the outside. This is about two feet square. The sides are of brick, and only sufficiently thick to sustain the top. The flue extends the length of the building, and returns to the chimney near the furnace door. The top of the furnace or flue may be covered with any old plates of cast iron, or sheets of boiler

iron; thicker iron, or a covering of brick or stone, might not admit of the escape of sufficient heat to dry the fruit with facility. The fruit is dried on trays or hurdles, arranged in three tiers, one above another, with a space of twelve or fifteen inches between them. The hurdles are two feet or more wide, and six feet or more long, and three inches deep. These are simple trays made of pine boards, with bottoms made of small strips, or laths of hard wood. Through the length of the building, and extending six or eight feet outside, scantling are put up to support the three tiers of hurdles. A broad door is made at the end of the building to correspond with each tier of hurdles. Upon each pair of scantling a frame is made to correspond with the width, which runs out and in the building upon rollers, in the form of a railroad. The frames are drawn out through the end of the building and the trays of fruit placed on them crosswise, and then run in. Thus arranged, with the three tiers of rails filled with trays of fruit, about one and a half or two barrels of fruit can be dried at once, requiring about twenty-four hours to complete the process. The trays nearest the fire, of course, will dry the fastest, and with the convenience of the railroad and the shutters in the end of the building, they may be drawn out and changed to the upper rails, when the whole may be equally dried within the twenty-four hours in the most perfect and uniform manner, without the least burning. The fire is made on the bottom of the furnace, which consumes less fuel, and keeps up a slow and more uniform heat than if placed above the draft.

In some instances I have seen old steam boilers, of small size, used for the furnace and flues, and these, where they can be obtained cheap, answer every purpose; these radiate the heat readily, and a small amount of fire answers the purpose.

There are many sections of the country where peaches and early apples cannot be readily sent to market, and as at this season of the year, when grass is abundant, they are of less value to feed to swine, they may be dried in this way to good profit. In remote sections of the country fruit-growing may be made a source of considerable profit, in this way. The demand for dried fruit will always be greater than the supply.—[Country Gentleman.

Curing Hams without Sugar.

"E. S. H." of Niagara county, says, in the Rural New Yorker, that he cures hams with simple salt and water (brine) equal to any treated with sugar or molasses and salt. He is careful to place them in the cask shank downward, and while smoking has them on racks, with the rind down, instead of hanging up in the usual way, "thus both the pickle and the smoke retaining the juices of the meat." Another correspondent thinks his recipe not only the cheapest but the very best in the world:—"For every 16 pounds of ham take one pint of pure salt, and one ounce of saltpetre. Pack in a clean oak cask, sprinkling the salt between the layers of meat. Dissolve the saltpetre and pour it over the whole, adding sufficient pure water to cover. Soft water is best. Let them lie under the brine six weeks, then smoke."

Potato Yeast and Yeast Cakes.

A correspondent of the Country Gentleman says:—"My wife makes a Potato Yeast which she considers superior to any other kind of yeast she has ever used, as it makes better bread, and is more convenient to use. It is made in the following manner:—Take ten potatoes of large size, pare, wash and boil them; when done mash them fine, and pour on them one quart of boiling water, and stir in one coffee cup of dry sugar. After standing a few minutes, pour on a gill less than a quart of boiling water; when it is lukewarm add one pint of the same kind of yeast if you have it, or of good hop yeast, to raise it. Put it in a stone jar and cover it up tight to ferment, and set it in a warm place till the potato rises on the top, and light foaming spots burst from the surface; then put the yeast in a stone jug and cork it tight. It will be necessary to tie the cork in and keep it tied, to prevent it being thrown out. After the yeast is put up it should be kept in a cool place; when wanted for use, open the jug and stir up the yeast. One-half of a teacupfull of it will make a large loaf of bread. In warm weather the yeast is better to make only one-half of the above quantity at a time, if but little used."

We find the following directions for making Yeast Cakes in the papers:—"Scald some flour with strong hop tea; when cool enough to bear your finger in it, set it to rise with good lively yeast; set at noon it ought to be light enough in the morning; stir in as much Indian meal as is required to mould it into a lump; cut it into thin slices on a board or tea waiter, with a cloth spread over it, then set it in the wind to dry. It should be made in dry weather, or it may sour. Two-thirds of a teacupfull will make a baking for an ordinary family. Soak fifteen minutes.

Green Copperas dissolved in water, it is said, will effectually concentrate and destroy the foulest smells, and if placed under a bed in hospitals and sick rooms, will render the atmosphere pure and free.

RURAL ECONOMY.

The Philosophy of Painting *

1. When water, or moisture, comes in contact with wood, the grain of the wood is raised, and when it comes to dry, the wood shrinks; and this shrinking and swelling will soon injure the surface, rendering it rough. When moisture comes in contact with iron, there is a CHEMICAL union; the oxygen of the air unites with the iron, and forms oxide of iron, or, what is familiarly called rust. Therefore, every time any rust is formed, the surface of the iron is rendered rougher and rougher.

2. Now, in order to prevent water from injuring the surface of wood, or iron, we spread a covering over it, to exclude the water, just as we cover a horse with oil cloth, to keep him dry; only, when we paint we apply the blanket, or covering, while it is in a liquid state. This covering soon changes into a thin pellicle, or blanket, which will exclude the water. Therefore, by excluding the moisture, we keep the grain of wood smooth, and the surface of iron bright and smooth also.

Materials for Making Paint.

3. Any substance that will become dry, after it is applied to the surface of wood, or iron, and which will form a thin pellicle, or blanket, that will exclude water, will make good paint.

4. Linseed oil is of such a nature that it will soon dry, when spread out thin, and will form a thin cover, that will exclude water. For this reason, there is no other kind of oil that is equal to linseed oil, for painting.

5. There is so much grease, or oleaginous substance, in lamp oil, kerosene, and sweet oil, that they will not dry like linseed oil. For this reason, such oils are not good for painting.

6. Paint is mingled with oil, for the purpose of keeping the oil as much on the surface as possible, and for making a thicker and heavier coat, or pellicle, which will resist the action of the atmosphere, or the influences of wet and dry.

Boiling Oil.

7. We boil oil for the purpose of evaporating or driving off the oleaginous or greasy portion of it, so that it will dry more readily.

8. Some painters have told beginners that oil must be boiled until it will burn a feather or quill. This rule is not correct; for oil will burn a quill before it is boiled half enough. Any person who knows how to make molasses and sugar, can boil oil well.

9. All that is necessary, in order to boil oil well, is to keep a steady fire, just hot enough to make the oil roll gently, for at least three or four hours.

10. Let a tablespoonful of litharge be put into about one gallon of oil before it is boiled, and when the oil is boiling it is well to stir it often, should any thing settle to the bottom of the kettle.

Lacker or Laquer.

11. This substance is a LIQUID DRIER, and will make good paint when used alone, without any oil. But it is rather expensive for such a purpose, when used alone. Therefore, we mingle it with oil for the purpose of making a better paint, and for making the oil or paint dry more readily.

12. The more laquer we put into paint, the sooner it will dry. Laquer is used in mixing all kinds of paint. Varnish will make a good laquer, but is expensive.

13. As some laquer is better than others, all that is necessary to use it economically is the exercise of a little good common sense.

Making White Paint.

14. If the white lead, or ZINC WHITE, has been ground fine, as it always should be before it is used, mingle boiled oil enough with it to make it about of the consistence of thick cream. Then pour in laquer enough to make it thin enough to spread readily with a brush. Good paint will always show for itself when it is just thick enough to flow well.

15. We usually make white paint, and then obtain any other desired color by mingling paint of other color with the white. I refer to ordinary painting. White lead will form a good body of paint so much cheaper than blue or green, or some kinds of yellow, that we use it in preference to making a paint of a given kind that is very expensive.

Dead-White Paint.

16. Take the best kind of white lead, or zinc white, and grind it in the purest linseed oil. Then mingle with it Demar Varnish, or white varnish, enough to make it thin enough to flow well from the brush.

17. If paint be prepared in this way, of good materials, it will be dry in a few hours after it has been laid on.

In case one has not access to a good paint

* Written for the ANNUAL REGISTER, by S. EDWARDS TODD.

mill, it would be as well to purchase a small can of white lead, that has been ground.

To make a Light Lead Color.

18. Let the paint be prepared as for dead-white paint, in the direction just given, and then mingle a very little LAMP BLACK with it. As much as one can take up on the point of a small knife will color a dish of white paint. Care must be exercised, lest too much black be put in. The black may be ground fine with the blade of a large knife.

Blue Paint.

19. In the first place, prepare white paint, (see Making White Paint.) and then mingle blue paint with it, and stir it thoroughly, until no streaks can be discovered in it. Then dip your brush and paint a little. If it seem too light colored, put in more blue, until it appears dark enough.

20. A small quantity of blue paint will make a large quantity of paint, if it be prepared in this manner. Blue makes the neatest and most durable paint for painting tools and implements.

Green Paint.

21. There are several kinds of green paint, to which we cannot allude in these very brief directions, which will all make good paint. Examine the green paints at the store.

22. Make a white paint, (see White Paint.) and then mingle green paint with it—stirring it thoroughly—until it appears to be of the right color or shade. The more green there is put in, the darker will be the paint.

23. Green paint is usually very heavy; therefore care must be exercised to have it of the proper consistence, or not too thick. If it be too thick, it will not flow freely from the brush, and will not be smooth when it is dry.

Red Paint.

24. Red paint is frequently made of oil, laquer and Venetian red. This will make a very dull looking red, and very cheap also.

To make red of a lighter color, make white paint as directed, and then mingle red lead, or any other kind of red paint, with the white, to suit the fancy.

25. Paint is sometimes made of pure red lead, oil and laquer. But, as red lead is so very heavy, it is rather difficult to lay it on smoothly, unless in a very warm room, and unless a person has had some experience in painting.

These directions have been prepared to aid beginners, in very ordinary painting.

Plaster of Paris and Gypsum in Painting.

26. Plaster of Paris, when it is ground fine, will make an excellent paint for outside work. I have been accustomed to use it, for painting buildings, for several years past, and I find that it is far more durable than white lead or zinc white. My practice has been, to mingle equal parts of Plaster of Paris and zinc, or white lead, with oil enough to make it of the consistence of cream, and then run it through a paint mill. This will form a good white paint, having an excellent body, which will be far more serviceable than white lead alone. And, more than all this, Plaster of Paris is very cheap.

27. For painting roofs of buildings, I have never met with any thing that is cheaper and better, where it is desirable to collect rain water, than gypsum and oil. It will form a very hard and durable covering for a roof, and is very clean.

28. Gypsum is sometimes ground very coarse. When it is so, it should be run through a paint mill before it is used.

Care of Paint Brushes.

29. Turn a new brush with the hair end up and handle down, and open the bristles and pour in about a spoonful of good varnish. Allow the varnish to become dry, and the brush will never shed its bristles when it is used in painting. The varnish will also keep brushes from shrinking and falling to pieces.

30. Brushes are usually kept in water, to prevent their drying up—but water is not half as good as oil for keeping them soft and pliable.

31. As soon as you have finished a job of painting, wipe out the brush clean, and wrap it in a piece of paper and hang it in a small deep vessel, containing oil, letting the brush descend into the oil up to the wrapping cord. In this way brushes of different colors, and even varnish brushes, can be kept clean and always ready for immediate use.

32. It is impossible to keep brushes, and especially varnish brushes, soft and pliable in water.

To make Rough Paint Smooth.

33. When paint has become rough by cracks, and when there are small seams in the wood that cannot be filled with putty, take a few spoonfuls of white lead, (English white lead is best.) and mix it up with boiled oil and laquer, about as thick as it can be mixed. Then take a small portion of it at a time and rub it into the cracks with the fingers, until the surface of the paint is smooth and even. Now smooth it off with a stiff brush, dipped in benzole or in spirits of turpentine, and let it dry. This is the easiest and most expeditious way to make the surface of rough paint smooth.

To make Old Paint Dry.

34. Sometimes paint that has been laid on for years is yet "sticky," and will never become hard. Such paint is a source of great annoyance.

35. To make it hard, so that it will not stick, apply to it, with a brush, a coat of benzole. (See Benzole ¶ 44.) After a day or two, if there is a good coat of paint on it, go over it with a thin coat of laquer, with one-third of its bulk of boiled oil mingled with it. In case the coat of paint is thin, apply another thin coat, which has been prepared by putting in a large proportion of laquer.

To make Old Varnish Dry.

36. Poor varnish sometimes, when applied to furniture, is a source of vexation. To make it dry and hard, apply a coat of benzole, (see Benzole, ¶ 44,) or spirits of turpentine, with a varnish brush, in a warm room. After two or three days, apply a coat of good varnish, and let it dry thoroughly before using the furniture. This is a certain remedy for "sticky" varnish.

37. Good varnish will always become hard in a short time—while cheap varnish, sometimes, will not become hard in several years.

To make Shellac Varnish.

38. Put a quantity of shellac in a bottle and pour in alcohol enough to cover it. Cork it tight, and place it on a shelf in a warm room, where the shellac will dissolve. Shake the bottle occasionally, and, if it is not all dissolved in three or four days, put in a little more alcohol.

This forms a good varnish, for varnishing almost any thing, which will dry in half an hour.

Coal Tar, or Tar Paint.

39. But very few people appreciate the value of this substance as a preservative of wood and iron, when it is used as a paint. It possesses wonderful antiseptic properties, and there is no kind of oil paint that will preserve wood or iron from decay, when it is exposed to the influences of the weather, equal to coal tar.

40. It is the refuse of gas works, and can always be obtained, where gas is made, at about $1 per barrel. It is less durable when it is exposed to sunshine than when it is always in the shade, or in wet and damp places.

41. This peculiarity makes it one of the most valuable substances that can be used for painting the ends of fence posts that are in the ground. No other substance is equal to it.

42. Gas companies, who were accustomed to use iron pipe, are now using wooden pipes, which have been saturated in coal tar, and there is no doubt that such wooden pipes will last for one hundred years. One of the members of the Gas Company in Ithaca told me that they had examined wooden pipes which were saturated with gas tar, which had been under ground for twenty-two years, and they showed no decay.

The way to Make it Dry.

43. Gas tar needs no preparation, only for painting tools and implements It needs something to make it dry. For this purpose, let it be WARMED in an iron kettle—not boiled—and mingle with it about one pint of benzole to one gallon of gas tar. This will make a beautiful black varnish, which will dry in a few hours. If it does not dry quickly enough, put in a little more benzole. (See Benzole, ¶ 44.)

Benzole.

44. Benzole is a volatile and nearly transparent fluid, which has the appearance of spirits of turpentine. It can be obtained at most drug stores, at about fifty cents per gallon.

45. It is frequently used as a good substitute for spirits turpentine, and is very much cheaper than that liquid, and for some purposes it is far more effective than turpentine.

To Remove Grease Spots from Clothes.

46. Grease spots, paint or gum, may be readily removed from woolen clothes, without the least injury to them.

Saturate the soiled portions of a garment thoroughly with benzole, (see Benzole;) then, with a small piece of woolen cloth, rub it, keeping it moist with benzole, until the spots have disappeared; then wash the spots with soap suds.

If the grease spots or grease on coat collars has become dry, let the benzole be applied an hour or more before it is rubbed. As soon as the benzole has softened the grease, soap suds will quickly remove it.

47. I have removed paint from garments that had been on them until it had become quite dry before the benzole was applied, and it did not injure them in the least. Coat collars can be cleaned in this way in a few minutes.

Prepared Glue for Wood.

48. Procure a bottle with a large mouth and fill it about two-thirds full with the best of glue. (Good glue is clear, of a light color, but poor glue is of a dark and dirty color.) Then pour in the best of alcohol, until the glue is covered with it. Cork it tight, and set it in a warm place. If the alcohol is good the glue will be dissolved in a few days

and be ready for use. If it appears too thick, pour in a little more alcohol. If it seems to be too thin, put in a little more glue, or leave the cork out for a few days and the alcohol will soon evaporate, so that the glue will be of the proper consistence. This glue will always be fit for use.

Glue should always be used in a warm room.

Prepared Glue for Leather.

49. Procure some isinglass at the drug store, and dissolve it in alcohol, as directed for wood glue, and keep the bottle well corked. Shave the surface of the leather a little, and apply the glue in a warm room, and squeeze the pieces together with clamps or a hand screw.

50. Leather belts are united in this way by scarfing or shiplapping the ends and glueing them, and they seldom come apart unless they be exposed to dampness or rain.

Leather belts that are glued together are much stronger, and will run smoother than those that have been tied with leather strings, or riveted together.

In case the alcohol is very strong, it may be diluted with rain water. When it is used the leather should be warmed, and the glue should be applied while warm, and the leather should be kept warm until it is thoroughly dry.

How to Clean and Oil Harness.

51. If the weather be cold, or even if the weather is not quite warm, the harness should be taken apart in a warm room, and washed clean with soap suds. Then hang up the different parts, and let them become dry on the surface. Leather should not be allowed to become thoroughly dry before it is oiled.

52. Now place a common milk pan on a bench, and put into it about two or more quarts of neat's foot oil. Then pass all the small parts of the harness through the oil, and hang them up where they will be warm but not hot. Apply oil to the collars, and the large portions of the harness, with a paint brush.

53. By this means leather will be kept soft and pliable. No more oil should ever be applied to leather than it will absorb very readily. Many people injure their harness by applying TOO MUCH oil. When oil is applied so abundantly to harness that it will work out to the surface in hot weather, it will absorb dirt and dust, which will make a harness look unaccountably out of order.

As soon as the oil is dried in, the harness should be varnished, with a light coat of the following leather varnish:

Leather Varnish for Harness.

54. Put a half pound of shellac, which may be obtained at the drug store, into a bottle. Pour in good alcohol, sufficient to cover the shellac; then place it on a shelf, in a warm room, and keep it corked close, to prevent rapid evaporation. Now pulverize a lump of gum camphor, as large as a hen's egg, and put that into the bottle. Put in also three or four spoonfuls of good lamp-black. Shake the bottle thoroughly twice a day. In two days, if the alcohol is good, it will be ready for use. Should the alcohol not be good enough to make a temperance man drunk, it will not dissolve the shellac in two weeks, unless the bottle were left open.

55. Apply this varnish to the harness with a paint brush. I have never met with any varnish that was equal to this kind for keeping harness in good condition. It will not make the leather hard, and it makes it nice to handle, and it will keep the dirt out and the oil in.

56. When oiling and varnishing a silver-plated harness, if any oil or varnish should be applied to the silver, dip a sponge or woolen cloth in spirits of turpentine, or in benzole, and sponge it off; then wipe such parts dry with a soft cloth, and rub them dry with a clean piece of buckskin, and an old harness will shine like a new one.

57. A brush that is used for laying on this kind of varnish, should be kept in oil, as directed in a preceding paragraph, otherwise it will soon become hard and unfit for use.

Way to Stop Leaks around Chimneys.

58. Mingle a quantity of quick lime, or water lime, with coal tar or with pine tar, until it is as stiff as putty. Then with a large knife spread it over the cracks between the chimney and the roof. This is an excellent substance for stopping leaks in any kind of roof, where there are cracks in it. It is good for stopping leaks in wooden eave troughs, where the water is not to be used for culinary purposes.

An Effectual and Easy Way to Mend Broken China and Glass Ware.

59. There are but few substances that will answer for this purpose; but the following will never fail. We have a large wash bowl that was broken in two parts, which has been mended in this manner for more than eight years, and is sound as if it had never been broken.

60. Let a small quantity of paint be prepared as directed, ¶ 14, and let it stand in a warm place until there is a thick pellicle or skin formed on the surface of it. Turn a portion of this pellicle over, and scrape off

about half a teaspoonful of the oil and paint that adheres to the under side of it, and apply it with a finger to the edges of the broken vessel, and then put the pieces together and tie them firmly with a strong string and keep the vessel in a warm place for a few months.

I never saw a piece of glass or earthen that this kind of cement would not hold firmly, as long as it was not exposed to boiling water.

To Keep the Hands Clean and Smooth.

61. Procure a piece of pumice stone at the drug store, and grind one side smooth on a grindstone. When the hands are rough and dirty, wash them in soap suds, and rub them with the smooth side of the pumice stone. Keep the pumice stone wet when using it, as it will be more effective when it is wet than when it is dry.

Remedy for Sore Hands.

62. What causes our hands to chap and crack? The outside skin becomes thick and stiff when it is cold, and when we work our fingers the skin has become so dry that it cracks. Hands never crack in warm weather. Let them be washed clean, with pumice stone, (see ¶ 61,) and oil them well every night and dry in the oil by the fire. This will keep them soft. S. EDWARDS TODD.

Short Rules in Rural Economy.

1. Paint all tools exposed to the weather, and if with a light colored paint they will heat, warp and crack the least in the sun.

2. Dip well seasoned shingles in lime, wash and dry them before laying, and they will last much longer, and not become covered with moss.

3. In hitching a horse to a common rail or worm fence, always select the inside corner, which will be more secure by its bracing position, and the halter will not become tangled among the projecting ends of the rails, as when hitched to an outside or projecting corner.

4. Always tie a halter by making first a single loop and then thrusting the end of the halter through this loop. This is quickly untied, and will never become untied of itself.

5. Dip the tips of nails in grease, and they will easily drive into any hard wood, where otherwise they would double and break.

6. In screwing nuts into any part of machinery, in cold weather, be careful not to heat them first by the hands, or they will contract, after being screwed on tight and become immovable afterwards.

7. In plowing or teaming on the road in hot weather, always rest the horses on an eminence, where they may receive the cool breeze, and where one minute will be worth two in a warm valley.

8. In setting out young orchards, always register the varieties immediately in a book, where they may be referred to in a few years, when the trees commence bearing and after the labels are lost and the names forgotten.

9. In laying out gardens for fruits and vegetables, place every thing in drills or rows, so that they may be cultivated by a horse, and thus save the expense of hand labor.

10. Plant a patch of osier willows on every farm. A rod square will furnish as many bands for binding cornstalks, straw, &c., as an acre of rye straw.

11. Remove every stone from the track in the highway. A single projection, which might have been removed in one minute, has battered and injured a thousand wagons, at a damage equal to a hundred days labor.

12. When board fences become old, and the boards begin to come off, nail upright facing strips upon them against each post, and the boards will be held to their place, and the fence will last several years longer.

13. Always set a post fence over a ditch, or near good drainage, and the posts, always remaining dry, will last many years longer than those standing in wet sub-soil.

14. In writing on wooden labels or marking sticks, with a common pencil, if the wood is first wet, the mark will last two years; if written on dry, one or two rains will wash it all away.

15. Always keep a supply of copper wire on hand, of different sizes, for repairing tools—it is greatly superior to either twine or iron wire.

16. Every farmer should have a neat tool room, against the smooth walls of which a suitable place should be provided for hanging up every tool. An accurate outline of each tool should be painted on the wall, to remind every man of its absence, when left out of place.

17. Oil paint, applied to houses and barns, out-buildings and fences, will last much longer, and harden better, if put on as late as the middle of autumn, instead of during the heat of summer.

18. Every bin and granary should have a scale, or upright row of figures marked inside, showing accurately the number of bushels to fill it up to each figure. This will enable the farmer to know at a glance how much grain he has raised, or has on hand.

Harrows for Stony Land.

A correspondent inquires the proper dimensions for these. A stout, double, square harrow is often made about as follows: three

timbers on each side the hinges, or six in all, each timber about 4 feet 8 inches long, 3 inches square, or 3 by 3½ inches—five teeth in each timber, or 30 in all—each tooth about seven-eighths by three-fourths of an inch, and a foot entire length. The strength may vary with the degree of stoneyness, and the teeth may be set back a little, to pass freely. Where there are few or no stones, many more and smaller teeth are more efficient.

Curing Corn Fodder.

Corn sown thickly for fodder, always heats and spoils when placed in large stacks, even if dried for several weeks previously. This deters many from raising this excellent and valuable crop. The best way is to cut and bind it in bundles, and place seven in each round shock. After drying thus several weeks, draw these shocks, and place two together, on ground near the foddering yard. These large or double shocks, if well made, will stand uninjured until foddered out. If placed on grass ground, the butts will not be frozen fast. They might be left in the field till needed in winter, but for the inconvenience of being thus frozen, and the liability of snow or mud in the field. They are most conveniently drawn in a common wagon box, one man handing the shocks, whole and upright, to another who stands in the wagon, and receives them, placing them in position, in two rows. If they have been well bound, when put up, with two osier or straw bands, they will keep snugly together.

Draining Lengthens the Season.

Farmers at the North often complain seriously that the seasons are too short for the execution of all their work, and the ripening of crops. A cure for this evil has been found in under-draining. Instead of waiting several weeks for the soil to become dry, they are enabled to plow well drained land at once, to take time by the forelock, and to get through their work without hurrying, before others have begun. It also enables them to work more economically, by not being compelled to hire extra labor in a hurried season. Dry lands being less liable to frost in autumn, the crops may continue to grow later. The editor of the New England Farmer estimates, from his own experiments, that he has thus lengthened the season five weeks.

Ice Houses.

These, when constructed of wood and boards, are severely tested in their durability, by the moisture flowing from the melting ice. Nothing can, therefore, be more effectual in preventing decay than to coat all the timbers and boards with gas tar, when they are dry or well seasoned. This treatment will prolong their durability many times.

Comparative Value of Fuel.

A correspondent of the COUNTRY GENTLEMAN gives the following table, showing the comparative value of fuel:

Shellbark Hickory	100
Pignut Hickory	95
White Oak	84
White Ash	77
Yellow Oak	60
Hard Maple	59
White Elm	58
Red Cedar	56
Dogwood	75
Scrub Oak	73
White Hazle	72
Apple Tree	70
Red Oak	69
White Beech	65
Black Walnut	65
Black Birch	62
Wild Cherry	55
Yellow Pine	54
Chestnut	52
Yellow Poplar	52
Butternut	51
White Birch	48
White Pine	42

The same species of wood may vary in density and value, being best if grown on dry land and exposed or in open ground. Some kinds of wood, such as hickory, owe a large share of their value to the heat of the coals left after burning.

Tackles and Ladders.

Tackles are very useful on a farm; they save much heavy lifting; they want to have two blocks, and a three-quarter or inch rope will answer. We have used one for fifteen years or more, to raise beeves and large hogs, and for hoisting corn up in the crib. It saves very much hard labor. We put a strap across from one handle to the other on the basket, leaving it long enough to throw over the side of the basket when filling, and having the tackle overhead and two baskets, you can unload corn very fast—for this you need a large hook on the lower block; but if you want to raise or lower bags, you need a chain with rings on each end, (such as are used in grist mills,) and slip-noose your bags. For a crib or granary over head, nothing is more preferable than a good tackle; their cost cannot be much; it is best to have hooks on both blocks. Ladders, too, are very useful on a farm, and have often saved buildings from fire; their cost is but trifling. For a long ladder they should be two feet

wide at the bottom and eighteen inches at top, and it is better to have flat pieces for the top, middle and bottom, pinned through the ends outside; smaller ladders should be narrower. Seasoned white oak rungs are best. Inch holes are large enough, if you get a good straight splitting chestnut the right size; and be careful and you can split it, or you can saw it, which is the best, provided you have a good rip-saw. Cold chisels are much needed on a farm, but seldom seen. Socket wedges are very useful to split rails, &c.—J. T. H., in COUNTRY GENTLEMAN.

Gas Tar for Posts.

This application is far better than the old mode of charring, and is much more easily applied. Charring only affects the outside, admitting moisture into the interior and rotting it; the tar, if applied hot to well seasoned posts, entirely excludes moisture. S. P. Wormley of Mich., states in the COUNTRY GENTLEMAN, that seven years ago he built a mile of board fence, placing the posts, for one minute, in a large kettle of hot gas tar, so as to coat them six inches above the surface. They now appear to be as sound as when set; the posts of another fence, set about the same time, without tarring, are about half decayed.

Ox-Eye Daisy.

One of the most successful examples we have ever met with of the destruction of this weed is on the farm of Isaac Garrett, of Upper Darby, near Philadelphia. This troublesome weed whitens the fields in profuse abundance in that region; but on this farm not a solitary weed could be found, after a diligent search. The following is the mode for its extirpation: Two successive crops of corn are raised on the ground, both well manured and thoroughly cultivated and hoed; this treatment removes nearly all the weeds. The subsequent dense crop of clover smothers most of the remainder, and the few scattering ones left are pulled up by hand. On another well managed farm in the neighborhood no daisies were to be seen where the land was heavily seeded to clover; but where a strip had partially failed, numbers of them were visible.

Use of Apples.

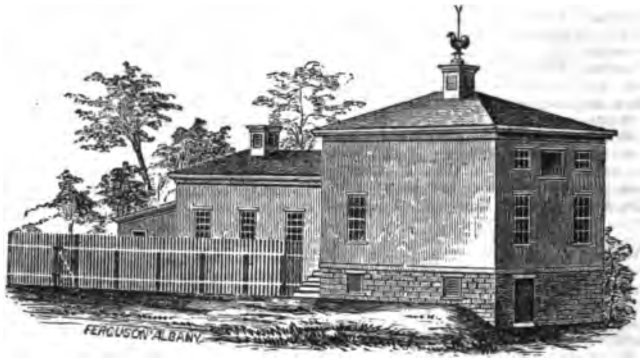
A profitable way of using surplus apples is feeding them to all kinds of domestic animals. Provide a large, dry cellar for them, where the temperature will be a little above freezing during the winter, and they will keep well. Horses are very fond of them; they are excellent for cows, also for sheep and swine, and are about as valuable as carrots and other roots.

Root Cellars above Ground.

Root cellars may be easily made above ground, that will afford sufficient protection to roots through winter—the requisites being thick non-conducting walls and roof. These walls may be made of different materials, according to circumstances. When lumber is abundant, posts may be set, inclosing the space desired for the roots, and another parallel row to form a double wall. If straw or forest leaves are used for filling in, the space should be two feet—if sawdust or chaff is used, one foot will do. Board up these posts, and ram in dry straw, (if chopped it will be better,) dry forest leaves, &c. A sloping or double roof should be made on rafters with boards, and second rafters placed a foot and a half or two feet above. Then fill in between them with straw or leaves. If chaff is used, the space need not be so great as for straw; and if the leaves are dry and smoothly placed, a foot thickness will do, as they form layers or strata, with thin inclosed plates of air, and are very good non-conductors of hèat (or cold.) Then cover the whole with a board roof, to throw off the water, and the building is complete. A door, made double and similarly stuffed, admits the roots. When lumber is scarce, build a double log structure, and fill in the space as before—or if the stuffing should be scarce, build a single wall, and bank up heavily with turf or earth. The roof may be made of poles instead of boards, laid closely enough to hold the leaves or straw; but the water soaking in will soon rot it, and it must be renewed. The bottom should be made of poles, a foot from the ground, so as to admit ventilation from below, to keep the roots dry, allow air to circulate among them, and to allow the soil from them the fall through. There are many modifications that might be made, but the main essentials are to be preserved, viz: to allow the warmth to pass up from the earth below, and to shut out cold from the sides, but more especially from the roof.

Substitute for Marker.

A correspondent of the COUNTRY GENTLEMAN, who uses Billings' Planter for corn, and Share's Horse Hoe for potatoes, does away with the common use of the marker, in the following way:—If the rows are to be three and a half feet apart, take a strip of wood, say one inch square and seven feet long; with two screws fasten it on the machine over the point of the share, so that it will project three and a half feet each way, to the right and left. To each end of the strips attach a short bit of small rope, or chain, so that one rope will hang directly over the last row planted.



THE POULTRY HOUSE OF W. H. HERRICK, ESQ., OSWEGO, N. Y.

Poultry Houses, Coops and Yards.

Whatever breeds of fowls be selected for keeping, provision must be made for their accommodation, comfort and safety. Fowls attached to farm houses lead a happy life. They have good air and plenty of room, with no lack of food. They wander about the farm yard, visit the adjacent fields, travel over the pasture or down the lane, troop around the barn, and enjoy total freedom. If to pure air is added pure water, and the opportunity of varying their diet by picking up insects and their larvæ, and a store of gravel, old mortar, and other calcareous matter, they are, so far, pretty sure to do well.

The extensive range of a farm, or the expensive arrangements of a magnificent aviary, are pleasant facilities for aiding the breeder, but they are not necessary for success in poultry keeping. The principal considerations of a fowl house are, warmth, light and ventilation. Warm in winter, because fowls require less food, will be healthier, and will lay more eggs; ventilated in summer and mild weather, because fresh air is absolutely necessary to all animated nature, and particularly to the fowl. Well lighted, because the fowls delight to be in a cheerful place, to bask in the sunshine admitted through the windows of their tenements, in cold weather. Particular care should be taken to afford the utmost ventilation in summer, by windows on two sides at least, to be of sufficient size to allow a perfect renovation of the within. Iron bars or strong wire grating may be inserted to protect from depredations at night.

One thing is to have a place where the fowls can feel comfortable and contented; and they like a large yard, where they can enjoy the sun and air, and fresh earth to scratch in.

The profit of a good fowl house is realized in the winter. All hens will lay in the spring, summer and autumn, but only those which have warm, well ventilated houses, will lay in winter.

The fowl house and yard should be located in a warm, sheltered, sunny place, with abundant grounds about it, where the fowls can graze—fowls eat grass—and scratch and enjoy themselves, in all seasons when the ground is open and they can scratch into or range over its surface, doing great benefit in their destruction of insects, and deriving much enjoyment to themselves; for hens, on the whole, are happy things.

Though a poultry yard should be open and airy, it should be sheltered from cold winds, and its soil must be dry. A simple shed should be erected in some sunny spot, to afford a screen for fowls from the hot rays of the mid-day's sun in summer, from the sharp winds of winter, and from heavy showers at all seasons. Should there be no access to orchards or pastures, it is desirable that a portion of the yard should be laid down to grass, or with turf, and consequently the larger the better. Cleanliness, both in the fowl house and in the yard, is indispensable. "Cleanliness," observes Mr. Beatson, "with as free circulation as possible, and a proper space for the poultry to run in, are essential to the rearing of poultry with advantage and success, as in narrow and confined situations they are never found to answer well." to which we may add, if the accommodations are narrow and confined, let the number of fowls be small in proportion.

The size of the fowl house must, of course, be in accordance with the number of fowls kept. A house twenty feet long and twelve feet wide, may be made to accommodate one hundred and fifty hens. The plan is simply this:—The first roosting perch, either of spruce or sassafras poles, two or three inches in diameter, with the bark on, so that the fowls can keep a firm hold, and not cramp their feet, should be placed lengthways, and rest on tressels in each end wall, six feet from the front wall, at a convenient height, say two feet from the floor. Another perch should be fixed above this, but one foot nearer to the back wall, and so on until there are four of these perches, like the steps of an inclined ladder. These roosts may be made in sections, and hung with hinges at top, for the purpose of raising them when cleaning the floor below. The house should face the south or southeast, and the front glazed to admit light and the warmth of the sun. In the summer the sashes may be removed and replaced with lattice, and shaded with evergreens.

In regard to nests, hens exhibit peculiar fancies, which like some of our watering places, suddenly become all the rage at one time, and pronounced unfashionable at another. Hens, you must know, are modest birds, and seek seclusion and privacy, while the symptoms of approaching egg-labor is strong upon them. It becomes us, therefore, to add every inducement to stimulate the instincts of nature; and to coax a hen to prolificacy, by consulting their tastes and whims. In a wild state, the nest of the hen is rude and inartificial; it is generally placed on the ground, under some covert by way of concealment. One of the greatest troubles in constructing laying nests is to secure good circulation of air, and to prevent accumulation of vermin and other filth. Great attention should always be paid to the cleanliness of the nests, and fresh materials, whether hay or straw, be placed in them. They should be at least two feet long, fourteen inches wide, eighteen inches high, and divided in the centre by a hole sufficiently large to admit a hen. The front of the nest should be latticed with fine lath, half an inch wide, to admit light and air, and apparent secrecy. These nests may be placed in different situations—some on the floor, others round in the nooks and corners, as much apart as possible. It is not at all required to have as many nests as hens, because they have not all occasion to occupy them at the same time, and besides, they are so far from having repugnance to lay in a common receptacle, that the sight of an egg stimulates them to lay. Often, however, the most secluded and darkest nests are preferred by the hens. The nests, if built into the wall, are in tiers from the bottom to the top, the lowest being about two feet from the ground, and one foot or more square, with a ledge for the hens to use when entering or on leaving them. There is one difficulty, however, in this plan, where hens occupy nests in common, when hatching others will often intrude and deposit their eggs, which, of course, if not removed, will be addled.

Where fancy fowls of different breeds are kept, each flock must have its own fowl house, and its own run or yard, or otherwise a mixture of the breeds will take place; in fact, a sort of aviary is requisite, in the construction of which much taste may be displayed, not of course without expense, for this is an affair of luxury and ornament, not of mere profit. Of such a character is the Royal Poultry House at the Home Farm at Windsor, England. Such aviaries are appropriate ornaments in the grounds or in the parks of the opulent, and their establishment tends to keep up the finer breeds of domestic poultry in their utmost purity. So far they are laudable; but they are kept up to gratify the taste, profit being neither expected nor desired.

The Poultry House, the view of which is given at the head of this article, and the plans and internal arrangements following, were furnished by the proprietor, for the COUNTRY GENTLEMAN, by request of the editors. In a communication, accompanying it, he says:

"I keep from 100 to 200 hens, of the Black Spanish breed, and keep them confined the year round, but disease is not known among them, and I can assure you that they do full as well as those kept by others, who believe that a fowl cannot do well unless they are kept scratching. My yard is only 25 by 60 feet, filled 12 inches deep with leached ashes and fine sand. I have a large box containing some 30 bushels of burnt oyster shells and bones, which the fowls have free access to, and when the top becomes too dirty, I take it off and put it around my grapevines. My gardener raises 600 head of cabbage annually, which is fed them through the winter, and in summer he gives them lettuce, all they want. I have a contract for ten beef heads weekly, and give them plenty of sour milk, in addition to all of which they have free access to a mixture of corn, oats, wheat and barley, which is kept in a bin holding some 40 bushels, so constructed as to regulate itself, and not allow the fowls to waste the grain, or scratch in it. My watering trough is so constructed as only to admit the heads of the fowls, and is always full of pure clean water,

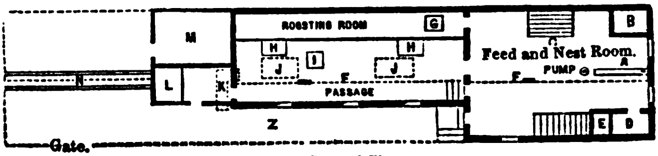


Fig. 2.—Ground Floor.

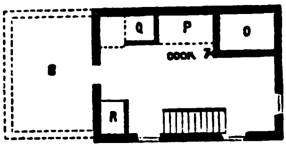


Fig. 3.—Basement.

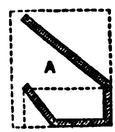


Fig. 4.—Section at A.

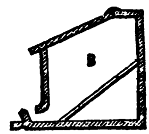


Fig. 5.—Section at B.

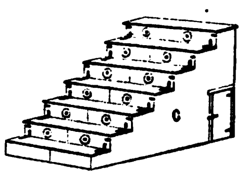


Fig. 6.—Section at C.

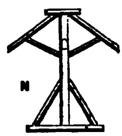


Fig. 7.—Section at N.

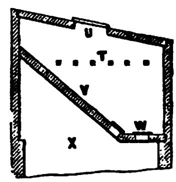


Fig. 8.—Section of Roosting Room.

Description and References to Illustrations.—A. A. Water trough and section. B. B. Feed box and section. Holds 50 bushels. C. C. Nests and section. Nest on each side of the hole, bei-g two for each entrance, which allows the hen to be out of sight while on the nest. The cover lifts up, for the purpose of taking out eggs, &c. The nests are so constructed as to be taken apart, by loosening the hooks, each one being the same as a drawer in a bureau. They can be taken apart, cleaned, oiled, and put up again in ten minutes or less. There are 24 nests in this set. Under the nests is a prison, where hens wanting to set are put for three days without food or water, which effects a perfect remedy. I claim this to be the best plan for nests extant. D. Tool closet. E. Ventilator from basement, and also used to send down hay from loft. F. F. Slat partitions. G. Trap door and spout leading to compost vault. H. H. Openings to roosting room. I. Ventilator. J. J. Openings in inclined floor under sky lights, to admit the light to lower floor, which warms in winter and keeps sand dry. K. Passage way from house to yard. L. Pile of burnt oyster shells, bones, &c. M. Pig pen. N. N. Covered shelter in yard, for fowls to use in either wet or sunny weather. O. Stone cistern in basement. P. Feed. Q. R. Cow stalls. S. Manure and compost vault. T. Roosts. U. Sky light, ventilator, &c. V. Inclined floor, for droppings. W. Trap and spout to the vault. X. Sand bottom. Z. Yard, all sand and ashes.

which is of more importance than any thing else in keeping poultry healthy.

"A barrel of lime, a bucket and a brush, are indispensable articles in a poultry house, and should be used every rainy day—whitewashing every thing but the floor, and using the lime dust on that. But wash the floor first. I have tried all your vermin preventives, and everybody else's, but never succeeded in keeping my fowls free until I found a remedy by experimenting.

"The nests are so constructed as to be all taken apart in two minutes; they are perfectly smooth, inside and out, and about once in two months I have them taken down, cleanly washed, and then thoroughly coated with common whale oil, and I have never yet seen a single louse near them, nor can one be found around my premises. The oil we apply with a common brush, and it can be relied upon as being a sure preventive against vermin on fowls.'

In addition to the foregoing plans, we would suggest more glass in the laying room—hens like light—which should face the south to admit the heat of the sun, which is of great importance in the winter, causing the hens to lay more freely in the cold season.

C. N. Bement.

THE ILLUSTRATED ANNUAL REGISTER OF RURAL AFFAIRS AND CULTIVATOR ALMANAC, FOR THE YEAR 1865,

CONTAINING PRACTICAL

SUGGESTIONS FOR THE FARMER AND HORTICULTURIST,

EMBELLISHED WITH ABOUT

One Hundred and Thirty Beautiful Engravings.

By J. J. THOMAS,

AUTHOR OF THE "AMERICAN FRUIT CULTURIST," AND "FARM IMPLEMENTS,"

ASSOCIATE EDITOR OF THE "COUNTRY GENTLEMAN" AND "CULTIVATOR."

ALBANY, N. Y.

LUTHER TUCKER & SON.

1865.

Publishers' Advertisement.

The present Number of the ILLUSTRATED ANNUAL REGISTER OF RURAL AFFAIRS will be found of as much general interest, it is thought, as any in the previous series. The subject of COUNTRY HOMES has again been taken up, after an interval of several years, and a number of attractive and convenient designs are presented. In the Number for 1864, a Calendar of Farm Operations was one of the leading features, and it is followed, in the present issue, by a chapter upon the HORTICULTURAL LABORS OF THE YEAR, rendered as complete and practical as possible for the purposes of the Fruit-grower. The article on PRUNING supplies just the information of which the inexperienced cultivator is most in need, and involves a subject on which there is perhaps more frequent inquiry than in any other one department of Orchard Management. Former articles on the Poultry-Yard and Apiary are now succeeded by chapters upon the TURKEY and the farther management of Bees; and under other heads there are included many concise and seasonable notes for the Farmer and Grazier, as well as the Housekeeper and Gardener.

THE ANNUAL REGISTER OF RURAL AFFAIRS, as many into whose hands this Number will come, are already aware, has now been published annually since 1855, appearing shortly before the opening year, and designed to supply, in connection with the usual Calendar Pages of an Almanac, a profusely illustrated and useful variety of contents, upon topics of Rural interest—serving to exemplify, as far as may be practicable, the progress we are making in Agriculture and Horticulture, and to condense, within small compass, as great a number as possible of valuable hints and suggestions for those engaged in farming and fruit-growing, and for persons who contemplate building, or who are already living, where there is a greater or less extent of land to cultivate and adorn. It constitutes almost a library in itself, and for preservation and reference an edition is issued triennially on larger and heavier paper, in bound volumes. On pages *v.* and *vi.* an advertisement will be noted of the Three Volumes already published; the Fourth will be ready in December, 1865, to contain the ANNUAL REGISTER for 1864, '65 and '66. A complete set, embracing the Three bound Volumes in Library form, as above, and the ANNUAL REGISTER in paper covers for 1864 and 1865, is now sent postpaid to any address for $5.00.

The Publishers also have the Numbers in paper covers, as they originally appeared, eleven in all, either of which may at any time be obtained by enclosing Twenty-Five Cents in a letter to LUTHER TUCKER & SON, *Albany, N. Y.*

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ILLUSTRATIONS.

VOLUME TWO.

Four Hundred and Fifty Illustrations.

A Complete Country Residence.—The Dwelling, Ornamental Grounds, Orchard, Gardens, Out-Houses, described and illustrated—concluding with an article on the APIARY, embracing the Management of Bees, by M. QUINBY.

Country Houses.—TWENTY-SEVEN DESIGNS, including some of great merit for Working-men's Cottages, and an illustrated Chapter on Ventilation.

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Farm Management.—Mr. THOMAS' Prize Essay, with new Illustrations—also, a Chapter on UNDER-DRAINING, pronounced by all, the most concise and complete of its kind that has yet appeared.

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Implements of Tillage.—Tillage—the Gang Plow—Improvements in Plows and Harrows—Plowing and Subsoiling—Ditching Plows—Implements for Surface Tillage.

Other New Implements, &c. — Farm Workshops—A Horse-Power—Hay Fork—Mill—Stalk Cutter—Potato Digger—Painting Tools—with numerous hints.

Rural and Domestic Economy.—Root Crops—Good and Bad Management—Dairy Economy—Rules for Business—Early Melons—Cleaning Seed Wheat—Packing Trees for Transportation, &c.

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Four Hundred and Forty Illustrations.

Working Men's Cottages.—SIX DESIGNS and Seventeen Engravings—the Cottages costing from $250 up to $800.

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Architecture.—Complete Directions for One, Two or Three Story Buildings, on the BALLOON FRAME System—24 Engravings—Directions as to Carpenter and Mason's Specifications, and a Glossary of Architectural Terms—48 Engravings.

Farm Husbandry.—How to render Farming Profitable, is treated in one or more Chapters, and a very great variety of Hints and Suggestions are given in Practical Matters and General Rural Economy.

Weeds and Grasses.—The chief varieties of Annual and Perennial Weeds, and of Useful Grasses, are described very fully, the former accompanied with 21 Engravings, and the latter with 13.

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Fruits and Fruit Culture.—The Newer Plums—Strawberries—Dwarf Pears—Management of the Grape—Summer Pears—Training Pyramids—Dwarf and other Apples—Cherries and Gooseberries—A Cheap Grapery, &c., &c.—more than 50 Engravings.

Flowers.—Pruning and Training Roses—Notes on New and Desirable Flowering Plants—20 Engravings.

Vegetable Physiology.—Tracing Growth of the Plant from the Embryo throughout—the Principles of Grafting and Budding, &c.—61 Engravings.

Domestic Animals.—A large variety of Hints as to Breeds and Management—THE APIARY; different Hives, and the Mode of Caring Properly for Bees.

The Dairy.—A full Chapter on Butter and Cheese Making, and Management of Cows, with numerous Hints.

The Poultry Yard.—A Complete Chapter, by C. N. BEMENT, with 33 Engravings of Fowls, Poultry Houses, &c.

Also—FILTERS and FILTERING CISTERNS, 5 Engravings—LIGHTNING RODS, 13—USEFUL TABLES, of Weights and Measures, &c.—MAPLE SUGAR Making. To these and many other subjects more or less space is devoted.

THE

CULTIVATOR ALMANAC,

FOR 1865.

ASTRONOMICAL CALCULATIONS IN EQUAL OR CLOCK TIME.

ECLIPSES FOR THE YEAR 1865.

I. A partial eclipse of the Moon April 10th, in the evening, or early in the morning of the 11th, visible. Size 2½ digits, or about one-fifth of the Moon's diameter. See table on next page.

II. A total eclipse of the Sun April 25th, invisible in North America, but visible in most of South America and Africa.

III. A partial eclipse of the Moon October 4th, in the evening, visible. The Moon will rise, on the United States east of the Mississippi river, partially eclipsed, and in the Pacific States it will be invisible. Size 4½ digits, or about one-third of the Moon's diameter. The beginning of the eclipse occurs before the Moon rises, and at all places west of the meridian of Buffalo the *middle* of the eclipse will occur before the rising of the Moon. See table on next page.

IV. An annular eclipse of the Sun October 19th, in the morning, visible throughout most of the United States as a *partial* eclipse. The track of central eclipse begins near Nesqually, in Washington Territory, on Puget's Sound, and passes southeasterly through Montana, Idaho, Kansas, Southern Missouri, Western Tennessee, and Georgia to Savannah. Along this line the eclipse will be 11 digits in size, and ring-like, the ring being ½ digit wide. See table on next page.

MORNING AND EVENING STARS.

Saturn will be Morning Star until January 19th; then Evening Star until October 26th; then Morning Star the rest of the year.

Mars will be Evening Star until November 11th, and then Morning Star the rest of the year.

Jupiter will be Morning Star until March 18th, and then Evening Star the rest of the year.

Venus will be farthest east of the sun, February 25, and will increase in brightness until April 1, being then in the west as Evening Star. Its position in the heavens at that time will be very near and a little west of the Pleiades, or seven Stars. It next appears as a Morning Star, exhibiting a long slender crescent, which rapidly grows wider and brighter, and on the 13th of June it will again be brightest, being then a short distance southwest of the Seven Stars. It will be at its greatest elongation west of the Sun July 16th. It then passes off towards the superior conjunction, and soon fades.

EQUINOXES AND SOLSTICES.

	D. H. M.		D. H. M.
Vernal Equinox, March	20 8 58 mo.	Autumnal Equinox, Sept.	22 7 51 ev.
Summer Solstice, June	21 5 38 mo.	Winter Solstice, Dec.	21 1 41 ev.

Table of the Solar Eclipse October 19, 1865.

Places.	Begins	Ends.	Digits	Places.	Begins.	Ends.	Digits.
	H. M.	H. M.			H. M.	H. M.	
Portland, Me.,..	9 18	0 30	6½	Cincinnati, ...	8 1	11 10	9⅝
Boston, ...	9 14	0 27	6⅞	Raleigh, ...	8 25	11 46	10
Quebec, ...	9 8	0 19	5¾	Charleston, ...	8 19	11 41	10½
Montreal, ...	8 57	0 7	6½	Madison, Wis.,.....	7 39	10 40	9¼
Montpelier, ...	9 6	0 17	6⅞	Springfield, Ill.,....	7 36	10 40	9½
Albany, ...	9 0	0 11	7¼	New Orleans,......	7 31	10 38	8¾
New-Haven,......	9 4	0 17	7½	St. Louis,.	7 36	10 40	10½
New-York, ...	8 55	0 12	7¾	Lawrence, Kansas,	7 9	10 6	11
Philadelphia,.....	8 47	0 5	8	Austin, Texas,.....	6 57	9 48	7¾
Rochester, ...	8 38	11 49 mo.	7¾	Mexico, ...	6 58	9 32	4¼
Toronto, ...	8 29	11 36 mo.	7¾	San Francisco,....	before	7 32	7½
Baltimore, ...	8 40	11 59 mo.	8½	Portland, Oregon,.	sunri'e	7 42	10¼
Washington, ...	8 37	11 56 mo.	8¾	Havana, Cuba,....	8 11	11 30	7¾
Richmond, Va.,..	8 34	11 55 mo.	9½	Buffalo, ...	8 30	11 40	8
Detroit, ...	8 9	11 17 mo.	8⅝	Chicago, ...	7 47	10 50	9¼

A Table of the Eclipses of the Moon April 10 and Oct. 4, 1865.

Principal places	April 10th.		October 4th.		Principal places.	April 10th.		Oct. 4.
	Begins eve. 10.	Ends mo. 11	Middle	End.		Begins eve. 10.	Ends mor. 11, eve. 10.	End.
	H. M.	H. M.	H. M.	H. M.		H. M.	H. M.	H. M.
Halifax, N. S.,	11 31	1 17	6 26	7 27	Pittsburg, Pa..	10 25	0 11 mo.	6 21
Brunswick,Me	11 6	0 52	6 1	7 2	Savannah, Ga.	10 21	0 7 mo.	6 17
Portland, Me..	11 4	0 50	5 59	7 0	St. Augustine,	10 19	0 5 mo.	6 15
Boston, Mass.,	11 1	0 47	5 56	6 57	Detroit, Mich.,	10 13	11 59 ev.	6 9
Quebec, C. E.,	11 0	0 46	5 55	6 56	Cincinnati, O.,	10 8	11 54 ev.	6 4
Concord, N.H.	10 59	0 45	5 54	6 55	Louisville,Ky.,	10 3	11 49 ev.	5 59
Hartford, Ct. .	10 54	0 41	5 49	6 50	Indianapolis,..	10 1	11 47 ev.	5 57
New Haven,Ct	10 53	0 39	5 48	6 49	Nashville,.....	9 58	11 44 ev.	5 54
Troy, N. Y....	10 51	0 37	5 46	6 47	Chicago, Ill.,..	9 55	11 41 ev.	5 51
Albany, N. Y..	10 50	0 36	5 45	6 46	Mobile, ...	9 52	11 38 ev.	5 48
New-York, ...	10 49	0 35	5 44	6 45	Madison, Wis.,	9 47	11 33 ev.	5 43
Trenton, N. J.	10 47	0 33	5 42	6 43	New Orleans,..	9 45	11 31 ev,	5 41
Philadelphia..	10 45	0 31	5 40	6 41	St. Louis, Mo.,	9 44	11 30 ev.	5 40
Baltimore.Md.	10 39	0 25	5 34	6 35	Natchez,Miss.,	9 40	11 26 ev.	5 36
Harrisburgh, .	10 38	0 24	5 33	6 34	Iowa City, ...	9 38	11 24 ev.	5 34
Washington ..	10 37	0 23	5 32	6 33	Little Rock,...	9 37	11 23 ev.	5 33
Petersburg,Va	10 36	0 22	5 31	6 32	Matamoras, ..	9 14	11 0 ev.	eclipse ends before the rising of the moon.
Richmond,Va.	10 35	0 21	5 30	6 31	Santa Fe.,N.M.	8 41	10 27 ev.	
Rochester,....	10 34	0 20	5 2[illegible]	6 30	Oregon City, .	7 41	9 27 ev.	
Buffalo, N. Y.	10 30	0 16	......	6 26	San Francisco,	7 35	9 21 ev.	
Toronto, C.W.	10 28	0 14	......	6 24	Astoria,Oregon	7 30	9 16 ev.	

THE CYCLES.

The year 1865 is the first after leap-year, and the latter part of the 89th, and beginning of the 90th year of American Independence; the 6,578th of of the Julian Period; the 7,373–4th of the Byzantine era; the 5,625–6th of the Jewish era; the 2,618th of Rome; the 2,612th of Nabonassar; the 2,641st of the Olympiads; the 2,177th of the Grecian era of the Seleucidæ; the 1,581st of Diocletian; the 1,282d of Mohammed, which begins 27th of May. Dominical Letter, A; Epact, 3; Golden Number, 4; Solar Cycle, 26; Roman Indiction, 8; Dionysian Period, 194. The Jewish year 5626, begins Sept. 21, 1865.

1st MONTH. # JANUARY, 1865. **31 DAYS.**

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
First Quarter, ·····	4	10 58 mo.	10 46 mo.	10 36 mo.	1	12 4 6
Full Moon, ·········	11	6 16 ev.	6 4 ev.	5 54 ev.	9	12 7 37
Third Quarter, ····	19	9 52 ev.	9 40 ev.	9 30 ev.	17	12 10 34
New Moon, · ·······	27	4 46 mo.	4 34 mo.	4 24 mo.	25	12 12 45

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. S.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey. Penn.. Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets.	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	A	22 57 56	7 30	4 38	9 30	1 52	7 25	4 43	9 31	11 25	7 19	4 49	9 32
2	M	22 52 29	7 30	4 39	10 42	2 39	7 25	4 44	10 42	morn	7 19	4 50	10 42
3	T	22 46 34	7 30	4 40	11 50	3 32	7 25	4 45	11 49	0 18	7 19	4 51	11 48
4	W	22 40 13	7 30	4 41	morn	4 26	7 25	4 46	morn	1 12	7 19	4 52	morn
5	T	22 33 24	7 30	4 41	1 0	5 24	7 25	4 46	0 57	2 10	7 19	4 52	0 55
6	F	22 26 9	7 30	4 42	2 5	6 26	7 25	4 47	2 2	3 12	7 19	4 53	1 59
7	S	22 18 27	7 30	4 43	3 11	7 30	7 25	4 48	3 7	4 16	7 19	4 54	3 3
8	A	22 10 19	7 30	4 44	4 13	8 32	7 25	4 49	4 9	5 18	7 19	4 55	4 5
9	M	22 1 45	7 30	4 45	5 11	9 31	7 25	4 50	5 6	6 17	7 19	4 56	5 2
10	T	21 52 46	7 29	4 46	6 4	10 23	7 24	4 51	5 59	7 9	7 19	4 57	5 55
11	W	21 43 20	7 29	4 47	rises.	11 7	7 24	4 52	rises.	7 53	7 18	4 58	rises.
12	T	21 33 20	7 29	4 48	6 1	11 51	7 24	4 53	6 4	8 37	7 18	4 59	6 6
13	F	21 23 14	7 28	4 49	7 0	ev.35	7 23	4 54	7 2	9 21	7 18	5 0	7 4
14	S	21 12 34	7 28	4 50	7 56	1 13	7 23	4 55	7 57	9 59	7 17	5 1	7 59
15	A	21 1 29	7 27	4 52	8 54	1 49	7 22	4 57	8 54	10 35	7 17	5 2	8 55
16	M	20 50 0	7 27	4 53	9 50	2 26	7 22	4 58	9 50	11 12	7 16	5 3	9 50
17	T	20 38 7	7 26	4 54	10 47	3 6	7 21	4 59	10 46	11 52	7 16	5 4	10 45
18	W	20 25 51	7 25	4 56	11 45	3 48	7 20	5 1	11 43	ev. 34	7 16	5 6	11 41
19	T	20 13 11	7 25	4 57	morn	4 35	7 20	5 2	morn	1 21	7 15	5 7	morn
20	F	20 0 9	7 24	4 58	0 42	5 22	7 19	5 3	0 39	2 8	7 14	5 8	0 36
21	S	19 46 44	7 23	4 59	1 41	6 21	7 18	5 4	1 37	3 7	7 14	5 9	1 34
22	A	19 32 58	7 22	5 1	2 40	7 20	7 18	5 5	2 37	4 6	7 13	5 10	2 32
23	M	19 18 49	7 22	5 2	3 40	8 22	7 17	5 6	3 36	5 8	7 12	5 11	3 31
24	T	19 4 19	7 21	5 3	4 37	9 22	7 16	5 7	4 32	6 8	7 12	5 12	4 27
25	W	18 49 28	7 20	5 4	5 30	10 19	7 16	5 8	5 26	7 5	7 11	5 13	5 22
26	T	18 34 17	7 19	5 5	6 19	11 8	7 15	5 9	6 15	7 54	7 10	5 14	6 11
27	F	18 18 45	7 19	5 7	sets.	11 58	7 14	5 11	sets.	8 44	7 9	5 15	sets.
28	S	18 2 54	7 18	5 8	7 11	morn	7 13	5 12	7 12	9 33	7 9	5 16	7 13
29	A	17 46 43	7 17	5 9	8 25	0 47	7 13	5 13	8 25	10 20	7 8	5 17	8 25
30	M	17 30 14	7 16	5 11	9 37	1 34	7 12	5 15	9 36	11 5	7 7	5 19	9 36
31	T	17 13 26	7 15	5 12	10 48	2 19	7 11	5 16	10 46	11. 56	7 7	5 20	10 44

Division of the Day into Hours.—The day began to be divided into hours from the year 293 B. C., when L. Papirius Cursor erected a sun-dial in the temple of Quirinus at Rome. Previous to the invention of water-clocks, 158 B. C., the time was called at Rome by public criers. The Chinese divided the day into twelve parts of two hours each. The Italians reckon twenty-four hours round, instead of two divisions of twelve hours each, as we do. In England the measurement of time was alike uncertain and difficult; one expedient was by wax candles, 3 inches burning an hour, and 6 wax candles burning 24 hours; these candles were invented by Alfred, clocks and hour-glasses not being then known in England, A. D. 886.

2d MONTH. FEBRUARY, 1865. 28 DAYS.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
FIRST QUARTER, ...	2	8 24 ev.	8 12 ev.	8 2 ev.	1	12 13 58
FULL MOON, ...	10	11 43 mo.	11 31 mo.	11 21 mo.	9	12 14 31
THIRD QUARTER, ...	18	4 54 ev.	4 42 ev.	4 32 ev.	17	12 14 14
NEW MOON, ...	25	3 19 ev.	3 7 ev.	2 57 ev.	25	12 13 14

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. S.	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Mary'ld, Virg'a, Kent'y, Miss'ri, and California.		
			SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets.	MOON sets.
		° ' "	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	W	16 56 20	7 14	5 14	11 56	3 10	7 10	5 18	11 54	morn	7 6	5 22	11 51
2	T	16 38 56	7 12	5 15	morn	4 4	7 9	5 19	morn	0 50	7 5	5 23	morn
3	F	16 21 15	7 11	5 17	1 3	5 4	7 8	5 20	1 0	1 50	7 4	5 24	0 56
4	S	16 3 16	7 10	5 18	2 7	6 7	7 7	5 21	2 3	2 53	7 3	5 25	1 59
5	A	15 45 1	7 9	5 19	3 5	7 10	7 6	5 22	3 1	3 56	7 2	5 26	2 56
6	M	15 26 31	7 8	5 21	3 58	8 12	7 5	5 24	3 54	4 58	7 1	5 27	3 49
7	T	15 7 45	7 7	5 22	4 46	9 10	7 4	5 25	4 42	5 56	7 0	5 28	4 38
8	W	14 48 44	7 6	5 24	5 28	10 11	7 3	5 26	5 24	6 47	6 59	5 29	5 20
9	T	14 29 27	7 5	5 25	6 5	10 46	7 2	5 28	6 2	7 32	6 58	5 30	5 59
10	F	14 9 57	7 3	5 26	rises.	11 24	7 0	5 29	rises.	8 10	6 57	5 31	rises.
11	S	13 50 12	7 2	5 27	6 46	ev. 4	6 59	5 30	6 47	8 50	6 56	5 32	6 47
12	A	13 30 13	7 1	5 29	7 42	0 41	6 58	5 32	7 42	9 27	6 55	5 34	7 42
13	M	13 10 1	7 0	5 30	8 39	1 17	6 56	5 33	8 39	10 3	6 54	5 35	8 38
14	T	12 49 37	6 58	5 31	9 34	1 51	6 55	5 34	9 33	10 37	6 53	5 36	9 31
15	W	12 29 0	6 57	5 32	10 33	2 28	6 54	5 35	10 31	11 14	6 51	5 37	10 28
16	T	12 8 11	6 55	5 33	11 30	3 11	6 53	5 36	11 27	11 57	6 50	5 38	11 24
17	F	11 47 10	6 54	5 34	morn	3 56	6 51	5 37	morn	ev. 42	6 49	5 39	morn
18	S	11 25 58	6 52	5 36	0 28	4 49	6 50	5 38	0 24	1 35	6 48	5 40	0 20
19	A	11 4 35	6 51	5 37	1 26	5 47	6 49	5 39	1 22	2 33	6 47	5 41	1 18
20	M	10 43 2	6 49	5 39	2 21	6 50	6 47	5 41	2 17	3 36	6 45	5 42	2 12
21	T	10 21 10	6 48	5 40	3 10	7 54	6 46	5 42	3 6	4 40	6 44	5 43	3 1
22	W	9 59 26	6 47	5 41	4 4	8 57	6 44	5 43	4 0	5 43	6 43	5 44	3 56
23	T	9 37 24	6 45	5 43	4 51	9 57	6 43	5 45	4 48	6 43	6 42	5 46	4 45
24	F	9 15 14	6 43	5 44	5 32	10 48	6 41	5 46	5 30	7 35	6 40	5 47	5 27
25	S	8 52 55	6 42	5 45	sets.	11 35	6 39	5 47	sets.	8 21	6 39	5 48	sets.
26	A	8 30 28	6 41	5 46	7 12	morn	6 38	5 48	7 12	9 11	6 38	5 49	7 12
27	M	8 7 54	6 39	5 47	8 27	0 25	6 37	5 49	8 25	9 59	6 36	5 50	8 24
28	T	7 45 13	6 37	5 48	9 39	1 13	6 36	5 49	9 37	10 44	6 34	5 51	9 35

DIFFERENCE OF DAYS.—There is a vast difference in the length of days. A *sidereal day* is the real and invariable period of the diurnal rotation of the earth on its axis, and contains 23 hours, 56 minutes, 3·5 seconds, of mean solar time; the *lunar day* is 24 hours, 48 minutes; and the *solar day*, which is the mean apparent time of one revolution of the earth on its axis, is 24 hours.

NAMES OF DAYS OF THE WEEK.—Sunday was called *Dies Solis*, or the Sun's day; Monday, *Dies Lunæ*, or the Moon's day; Tuesday, *Dies Martis*, or Mar's day; Wednesday, *Dies Mercurii*, or Mercury's day; Thursday, *Dies Jovis*, or Jupiter's day; Friday, *Dies Veneris*, or Venus' day; and Saturday, *Dies Saturni*, or Saturn's day. The reason they were named thus, was because they considered each of these deities to preside over the day dedicated to them.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
First Quarter,·····	4	7 35 mo.	7 23 mo.	7 13 mo.	1	12 12 30
Full Moon,·········	12	5 58 mo.	5 46 mo.	5 36 mo.	9	12 11 9
Third Quarter,····	20	7 52 mo.	7 40 mo.	7 30 mo.	17	12 8 24
New Moon,· ·······	27	0 44 mo.	0 32 mo.	0 22 mo.	25	12 5 58

Day of Month.	Day of Week.	Sun's declens. S.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			Sun rises	Sun sets.	Moon sets.	H. W. Bost.	Sun rises	Sun sets.	Moon sets.	H. W. N. Y.	Sun rises	Sun sets.	Moon sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	W	7 22 25	6 35	5 50	10 50	1 58	6 35	5 50	10 47	11 35	6 33	5 52	10 44
2	T	6 59 31	6 33	5 51	11 56	2 49	6 33	5 51	11 53	morn	6 31	5 53	11 49
3	F	6 36 32	6 32	5 53	morn	3 44	6 32	5 53	morn	0 30	6 30	5 54	morn
4	S	6 13 27	6 30	5 54	0 58	4 43	6 30	5 54	0 54	1 29	6 29	5 55	0 50
5	A	5 50 17	6 29	5 55	1 55	5 47	6 29	5 55	1 51	2 33	6 27	5 56	1 46
6	M	5 27 2	6 27	5 56	2 43	6 49	6 27	5 56	2 38	3 35	6 26	5 57	2 34
7	T	5 3 43	6 26	5 58	3 28	7 49	6 26	5 58	3 25	4 35	6 25	5 58	3 21
8	W	4 40 20	6 24	5 59	4 6	8 45	6 24	5 59	4 3	5 31	6 24	5 59	4 0
9	T	4 16 53	6 23	6 0	4 40	9 34	6 23	6 0	4 38	6 20	6 22	6 0	4 35
10	F	3 53 24	6 21	6 1	5 13	10 18	6 21	6 1	5 11	7 4	6 20	6 1	5 9
11	S	3 29 51	6 19	6 2	5 41	10 55	6 19	6 2	5 40	7 41	6 18	6 2	5 39
12	A	3 6 16	6 17	6 3	rises.	11 28	6 17	6 3	rises.	8 14	6 17	6 3	rises.
13	M	2 42 39	6 15	6 5	7 29	ev. 8	6 15	6 4	7 27	8 54	6 15	6 4	7 26
14	T	2 19 1	6 14	6 6	8 26	0 45	6 14	6 5	8 24	9 31	6 14	6 5	8 22
15	W	1 55 21	6 12	6 7	9 22	1 23	6 12	6 6	9 19	10 9	6 13	6 6	9 16
16	T	1 31 40	6 10	6 8	10 20	1 58	6 10	6 7	10 17	10 44	6 11	6 7	10 13
17	F	1 7 58	6 9	6 9	11 16	2 40	6 9	6 8	11 13	11 26	6 10	6 8	11 8
18	S	0 44 16	6 7	6 10	morn	3 28	6 7	6 9	morn	ev.14	6 8	6 9	morn
19	A	0 20 34	6 5	6 11	0 12	4 20	6 5	6 10	0 8	1 6	6 6	6 10	0 3
20	M	N 3 8	6 3	6 13	1 6	5 18	6 3	6 12	1 2	2 4	6 5	6 11	0 57
21	T	0 26 49	6 2	6 14	1 54	6 23	6 2	6 13	1 50	3 9	6 3	6 12	1 46
22	W	0 50 29	6 0	6 15	2 41	7 29	6 0	6 14	2 37	4 15	6 2	6 13	2 34
23	T	1 14 7	5 59	6 17	3 23	8 31	5 59	6 15	3 20	5 17	6 1	6 14	3 17
24	F	1 37 44	5 57	6 18	4 2	9 31	5 58	6 16	4 0	6 17	5 59	6 15	3 58
25	S	2 1 18	5 55	6 19	4 41	10 25	5 56	6 17	4 40	7 11	5 57	6 16	4 39
26	A	2 24 49	5 53	6 20	5 17	11 12	5 55	6 18	5 17	7 58	5 56	6 17	5 17
27	M	2 48 17	5 52	6 21	sets.	morn	5 54	6 19	sets.	8 48	5 54	6 18	sets.
28	T	3 11 42	5 51	6 22	8 26	0 [illegible]	5 52	6 20	8 24	9 39	5 53	6 19	8 21
29	W	3 35 4	5 49	6 23	9 38	0 53	5 51	6 21	9 34	10 24	5 52	6 20	9 31
30	T	3 58 21	5 47	6 24	10 44	1 38	5 49	6 22	10 40	11 15	5 50	6 21	10 36
31	F	4 21 34	5 45	6 25	11 44	2 29	5 47	6 23	11 40	morn	5 48	6 22	11 35

Month.—The *calendar* month is a twelfth division of the year. A *solar* month is the time in which the sun passes through a whole sign of the zodiac—it is 30 days, 10 hours, 29 minutes, and 5 seconds. A *lunar* month or the period of one moon, is 29 days, 12 hours, 44 minutes, and 3 seconds. A *civil* month consists of a certain number of days, according to the laws and customs of different countries. In the year there are 12 solar months, and 13 lunar months.

Dog Days.—These days commence on the 3d of July, and end on the 11th of August. Dr. Hutton says that common opinion has been accustomed to regard the rising and setting of Sirius, or the "dog star," with

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
First Quarter,·····	2	8 35 ev.	8 23 ev.	8 13 ev.	1	12 3 50
Full Moon,·········	10	11 43 ev.	11 31 ev.	11 21 ev.	9	12 1 30
Third Quarter,····	18	6 36 ev.	6 24 ev.	6 14 ev.	17	11 59 26
New Moon,·········	25	9 30 mo.	9 18 mo.	9 8 mo.	25	11 57 49

Day of Month.	Day of Week.	Sun's declens. N. ° ′ ″	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon. Sun rises. H M	Sun sets. H M	Moon sets. H M	H. W. Bost. H M	CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois. Sun rises. H M	Sun sets. H M	Moon sets. H M	H. W. N. Y. H M	CALENDAR For Washington, Mary'ld, Virg'a, Kent'y, Miss'ri, and California. Sun rises. H M	Sun sets. H M	Moon sets. H M
1	S	4 44 42	5 43	6 26	morn	3 24	5 45	6 24	morn	0 10	5 46	6 22	morn
2	A	5 7 44	5 41	6 27	0 38	4 22	5 42	6 25	0 34	1 8	5 44	6 23	0 30
3	M	5 30 42	5 40	6 28	1 25	5 20	5 41	6 26	1 22	2 6	5 43	6 24	1 17
4	T	5 53 33	5 38	6 29	2 6	6 20	5 39	6 27	2 3	3 6	5 41	6 25	2 0
5	W	6 16 18	5 36	6 30	2 42	7 17	5 37	6 28	2 40	4 3	5 39	6 25	2 37
6	T	6 38 57	5 34	6 31	3 14	8 9	5 35	6 29	3 12	4 55	5 38	6 26	3 10
7	F	7 11 29	5 32	6 32	3 44	8 59	5 33	6 30	3 43	5 45	5 37	6 27	3 42
8	S	7 23 54	5 30	6 33	4 11	9 43	5 31	6 31	4 11	6 29	5 35	6 28	4 11
9	A	7 46 11	5 29	6 34	4 39	10 24	5 30	6 32	4 40	7 10	5 33	6 29	4 40
10	M	8 8 20	5 27	6 35	rises.	11 0	5 28	6 33	rises.	7 46	5 31	6 30	rises.
11	T	8 30 21	5 25	6 36	7 16	11 35	5 26	6 34	7 14	8 21	5 29	6 31	7 11
12	W	8 52 14	5 24	6 37	8 13	ev. 15	5 25	6 35	8 10	9 1	5 28	6 32	8 7
13	T	9 13 58	5 22	6 38	9 10	0 55	5 24	6 36	9 7	9 41	5 27	6 33	9 3
14	F	9 35 33	5 21	6 39	10 7	1 35	5 22	6 37	10 3	10 21	5 25	6 34	9 59
15	S	9 56 58	5 19	6 40	11 0	2 18	5 21	6 38	10 56	11 4	5 24	6 35	10 51
16	A	10 18 14	5 17	6 41	11 50	3 6	5 20	6 39	11 46	11 52	5 23	6 36	11 42
17	M	10 39 19	5 16	6 42	morn	3 59	5 18	6 40	morn	ev. 45	5 21	6 37	morn
18	T	11 0 14	5 15	6 43	0 36	4 57	5 16	6 41	0 33	1 43	5 20	6 38	0 29
19	W	11 20 58	5 13	6 44	1 19	5 59	5 15	6 42	1 16	2 45	5 19	6 39	1 13
20	T	11 41 31	5 12	6 46	1 57	6 52	5 13	6 44	1 55	3 48	5 17	6 40	1 53
21	F	12 1 53	5 10	6 47	2 35	8 4	5 11	6 45	2 34	4 50	5 15	6 41	2 33
22	S	12 22 3	5 8	6 48	3 11	9 4	5 10	6 46	3 10	5 50	5 14	6 42	3 10
23	A	12 42 1	5 6	6 49	3 47	10 0	5 9	6 47	3 48	6 46	5 13	6 43	3 49
24	M	13 1 47	5 4	6 51	4 25	10 52	5 7	6 48	4 27	7 38	5 11	6 44	4 29
25	T	13 21 18	5 3	6 52	sets.	11 39	5 6	6 49	sets.	8 25	5 10	6 45	sets.
26	W	13 40 39	5 2	6 53	8 20	morn	5 5	6 50	8 17	9 18	5 9	6 46	8 13
27	T	13 59 45	5 1	6 54	9 28	0 32	5 3	6 51	9 24	10 9	5 7	6 47	9 20
28	F	14 18 37	4 59	6 56	10 26	1 23	5 2	6 52	10 22	10 55	5 6	6 48	10 17
29	S	14 37 15	4 57	6 57	11 18	2 9	5 1	6 53	11 14	11 48	5 4	6 49	11 10
30	A	14 55 38	4 56	6 58	morn	3 2	5 0	6 54	11 58	morn	5 3	6 50	11 55

the sun, as the cause of excessive heat, and of consequent calamities, instead of its being viewed as the sign when such effects might be expected. The star not only varies in it's risings in every one year as the latitude varies, but is always later every succeeding year in all latitudes; so that in time the star may, by the same rule, come to be charged with bringing frost and snow.

Singular Fact.—Were the atmosphere at all times of a uniform temperature, there never would be hail, rain, nor snow. The water absorbed by it in evaporation from the sea and the earth's surface would descend in an imperceptible vapor, or cease to be absorbed by the air when it was once fully saturated. The absorbing power of the atmosphere and conse-

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
First Quarter,	2	11 20 mo.	11 8 mo.	10 58 mo.	1	11 56 56
Full Moon,	10	3 39 ev.	3 27 ev.	3 17 ev.	9	11 56 14
Third Quarter,	18	1 56 mo.	1 44 mo.	1 34 mo.	17	11 56 9
New Moon,	24	6 6 ev.	5 54 ev.	5 44 ev.	25	11 56 39

Day of Month.	Day of Week.	Sun's declens. N.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey. Penn.. Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			Sun rises	Sun sets.	Moon sets.	H. W. Bost.	Sun rises	Sun sets.	Moon sets.	H. W. N. Y.	Sun rises	Sun sets.	Moon sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	M	15 13 47	4 54	6 59	0 2	3 54	4 59	6 55	morn	0 40	5 2	6 52	morn
2	T	15 31 41	4 53	7 0	0 42	4 48	4 58	6 56	0 39	1 34	5 1	6 53	0 36
3	W	15 49 19	4 51	7 1	1 15	5 43	4 57	6 57	1 12	2 29	5 0	6 54	1 10
4	T	16 6 42	4 50	7 2	1 46	6 36	4 56	6 58	1 45	3 22	4 59	6 55	1 44
5	F	16 23 48	4 49	7 3	2 15	7 29	4 55	6 59	2 14	4 15	4 58	6 56	2 14
6	S	16 40 38	4 48	7 4	2 43	8 15	4 54	7 0	2 43	5 1	4 57	6 56	2 43
7	A	16 57 12	4 47	7 5	3 10	9 3	4 53	7 1	3 11	5 49	4 56	6 57	3 12
8	M	17 13 29	4 46	7 6	3 38	9 47	4 52	7 2	3 40	6 33	4 55	6 58	3 42
9	T	17 29 28	4 45	7 7	4 9	10 28	4 51	7 3	4 12	7 14	4 54	6 59	4 15
10	W	17 45 10	4 44	7 8	rises.	11 7	4 50	7 4	rises.	7 53	4 53	7 0	rises.
11	T	18 0 34	4 43	7 9	8 1	11 49	4 49	7 5	7 57	8 35	4 52	7 1	7 53
12	F	18 15 40	4 42	7 10	8 57	ev.33	4 48	7 6	8 53	9 19	4 51	7 2	8 48
13	S	18 30 28	4 41	7 11	9 48	1 17	4 47	7 7	9 44	10 3	4 50	7 3	9 40
14	A	18 44 57	4 40	7 12	10 36	2 0	4 45	7 8	10 33	10 46	4 49	7 4	10 28
15	M	18 59 7	4 39	7 13	11 19	2 48	4 44	7 9	11 15	11 34	4 48	7 5	11 12
16	T	19 12 58	4 38	7 14	11 56	3 40	4 43	7 10	11 54	ev.26	4 47	7 6	11 51
17	W	19 26 30	4 37	7 15	morn	4 36	4 42	7 11	morn	1 22	4 46	7 7	morn
18	T	19 39 42	4 36	7 16	0 25	5 34	4 41	7 12	0 23	2 20	4 45	7 7	0 21
19	F	19 52 33	4 35	7 17	1 9	6 36	4 40	7 13	1 8	3 22	4 44	7 8	1 8
20	S	20 5 5	4 35	7 18	1 44	7 38	4 39	7 14	1 44	4 24	4 44	7 9	1 44
21	A	20 17 16	4 34	7 19	2 20	8 41	4 38	7 15	2 22	5 27	4 43	7 10	2 23
22	M	20 29 7	4 33	7 20	2 58	9 39	4 37	7 16	3 0	6 25	4 42	7 10	3 2
23	T	20 40 36	4 32	7 21	3 40	10 33	4 36	7 17	3 43	7 19	4 42	7 11	3 46
24	W	20 51 44	4 31	7 22	sets.	11 22	4 35	7 18	sets.	8 8	4 41	7 12	sets.
25	T	21 2 31	4 30	7 23	8 9	morn	4 35	7 19	8 5	8 59	4 40	7 13	8 0
26	F	21 12 56	4 29	7 24	9 6	0 13	4 34	7 20	9 2	9 48	4 40	7 14	8 58
27	S	21 22 59	4 28	7 25	9 54	1 2	4 33	7 21	9 51	10 35	4 39	7 14	9 47
28	A	21 32 40	4 28	7 26	10 37	1 49	4 33	7 22	10 33	11 20	4 38	7 15	10 30
29	M	21 41 58	4 27	7 27	11 14	2 34	4 32	7 23	11 11	morn	4 38	7 16	11 9
30	T	21 50 54	4 26	7 28	11 46	3 23	4 31	7 24	11 44	0 9	4 37	7 16	11 42
31	W	21 59 27	4 26	7 28	morn	4 10	4 31	7 25	morn	0 56	4 37	7 17	morn

quently its capacity to retain humidity, is proportionably greater in warm than in cold air. The air near the surface of the earth is warmer than it is in the region of the clouds. The higher the ascent from the earth, the colder does the air become. Hence the perpetual snow on very high mountains in the hottest climate.

Atmosphere.—The fluid or gas which we feel on passing our hand through it, and whose force is visible in a high wind. It is 820 times less dense than water, but its elastic pressure or reaction is equal to 15 pounds to the square inch, which is also the weight or action downward; and it is composed of about one part oxygen, and four parts nitrogen or azote.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
First Quarter,	1	3 37 mo.	3 25 mo.	3 15 mo.	1	11 57 34
Full Moon,	9	4 57 mo.	4 45 mo.	4 35 mo.	9	11 58 58
Third Quarter,	16	7 9 mo.	6 57 mo.	6 47 mo.	17	12 0 37
New Moon,	23	3 14 mo.	3 2 mo.	2 52 mo.	25	12 2 21
First Quarter,	30	8 56 ev.	8 44 ev.	8 34 ev.		

Day of Month.	Day of Week.	Sun's declens. N.	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Mary'ld, Virg'a, Kent'y, Miss'ri, and California.		
			Sun rises	Sun sets.	Moon sets.	H. W. Bost.	Sun rises	Sun sets.	Moon sets.	H. W. N. Y.	Sun rises	Sun sets.	Moon sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	22 7 38	4 25	7 29	0 17	5 0	4 31	7 24	0 16	1 46	4 36	7 18	0 15
2	F	22 15 25	4 24	7 30	0 45	5 49	4 30	7 25	0 44	2 35	4 36	7 19	0 44
3	S	22 22 48	4 24	7 30	1 12	6 39	4 30	7 25	1 13	3 25	4 35	7 19	1 13
4	A	22 29 48	4 23	7 31	1 40	7 31	4 29	7 26	1 42	4 17	4 35	7 20	1 43
5	M	22 36 26	4 23	7 32	2 10	8 20	4 29	7 27	2 12	5 6	4 35	7 20	2 15
6	T	22 42 38	4 23	7 33	2 43	9 11	4 28	7 27	2 46	5 57	4 34	7 21	2 49
7	W	22 48 28	4 22	7 33	3 20	9 58	4 28	7 28	3 24	6 44	4 34	7 21	3 28
8	T	22 53 53	4 22	7 34	4 3	10 44	4 28	7 28	4 7	7 30	4 34	7 22	4 11
9	F	22 58 54	4 22	7 35	rises.	11 26	4 28	7 29	rises.	8 12	4 34	7 22	rises.
10	S	23 3 31	4 22	7 35	8 33	ev. 13	4 28	7 29	8 29	8 59	4 34	7 23	8 25
11	A	23 7 43	4 22	7 36	9 18	1 0	4 28	7 30	9 14	9 46	4 34	7 24	9 11
12	M	23 11 31	4 22	7 37	9 59	1 44	4 28	7 30	9 56	10 30	4 34	7 25	9 53
13	T	23 14 55	4 22	7 37	10 38	2 30	4 28	7 31	10 36	11 16	4 34	7 25	10 34
14	W	23 17 53	4 22	7 38	11 12	3 21	4 28	7 31	11 11	ev. 7	4 34	7 26	11 10
15	T	23 20 28	4 22	7 38	11 47	4 12	4 28	7 32	11 47	0 59	4 33	7 27	11 46
16	F	23 22 37	4 22	7 38	morn	5 11	4 28	7 32	morn	1 57	4 33	7 27	morn
17	S	23 24 22	4 22	7 39	0 20	6 11	4 28	7 33	0 21	2 57	4 33	7 28	0 22
18	A	23 25 42	4 22	7 39	0 56	7 16	4 28	7 33	0 58	4 2	4 33	7 28	1 0
19	M	23 26 38	4 23	7 39	1 35	8 18	4 29	7 34	1 38	5 4	4 33	7 28	1 41
20	T	23 27 8	4 23	7 39	2 18	9 20	4 29	7 34	2 22	6 6	4 34	7 28	2 25
21	W	23 27 14	4 23	7 39	2 58	10 18	4 29	7 34	3 2	7 4	4 34	7 28	3 6
22	T	23 26 55	4 23	7 40	4 1	11 6	4 29	7 34	4 5	7 52	4 34	7 29	4 10
23	F	23 26 11	4 23	7 40	sets.	11 56	4 29	7 35	sets.	8 42	4 34	7 29	sets.
24	S	23 25 2	4 24	7 40	8 31	morn	4 30	7 35	8 27	9 29	4 35	7 29	8 24
25	A	23 23 29	4 24	7 40	9 11	0 43	4 30	7 35	9 8	10 13	4 35	7 29	9 5
26	M	23 21 31	4 24	7 40	9 45	1 27	4 30	7 35	9 43	10 51	4 35	7 29	9 41
27	T	23 19 8	4 25	7 40	10 17	2 5	4 30	7 35	10 15	11 36	4 35	7 29	10 14
28	W	23 16 21	4 25	7 40	10 46	2 48	4 31	7 35	10 46	morn	4 36	7 29	10 45
29	T	23 13 9	4 25	7 40	11 15	3 31	4 31	7 35	11 15	0 17	4 36	7 29	11 15
30	F	23 9 33	4 25	7 40	11 42	4 16	4 31	7 35	11 43	1 2	4 36	7 29	11 44

All space is filled with gas, but the passage of the earth through it, and its rotation at the same time, condenses the rare gas of space into an atmosphere, which at the surface of the earth is such as we find it, but is rarer and rarer as we ascend, till at the height of 45 miles, it no longer reflects light; nor is it capable of keeping clouds in suspension above two or three miles. The energy of the oxygenous part of the atmosphere transferred is the cause of fire, combustion, animal heat and life. In volume the atmosphere consists of 79 parts of azote or nitrogen; of 21 of oxygen; of 1.33 aqueous vapor, and of 0.1 of carbonic acid. In weight, 76.6 of azote; 23.3 of oxygen; 0.83 of aqueous vapor, and 0.15 of carbonic acid gas.

7th MONTH. JULY, 1865. 31 DAYS.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
FULL MOON, ...	8	3 45 ev.	3 33 ev.	3 23 ev.	1	12 3 34
THIRD QUARTER, ...	15	11 43 mo.	11 31 mo.	11 21 mo.	9	12 4 55
NEW MOON, ...	22	1 45 ev.	1 33 ev.	1 23 ev.	17	12 5 50
FIRST QUARTER, ...	30	2 25 ev.	2 13 ev.	2 3 ev.	25	12 6 13

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon. SUN rises	SUN sets.	MOON sets.	H. W. Bost.	CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois. SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. SUN rises	SUN sets.	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	S	23 5 33	4 26	7 40	morn	5 2	4 31	7 35	morn	1 48	4 37	7 29	morn
2	A	23 1 8	4 26	7 40	0 11	5 52	4 32	7 35	0 13	2 38	4 37	7 29	0 15
3	M	22 56 20	4 27	7 40	0 43	6 45	4 32	7 35	0 45	3 31	4 38	7 29	0 48
4	T	22 51 7	4 27	7 39	1 16	7 39	4 33	7 34	1 19	4 25	4 38	7 28	1 23
5	W	22 45 31	4 28	7 39	1 57	8 36	4 33	7 34	2 0	5 22	4 39	7 28	2 5
6	T	22 39 31	4 29	7 39	2 42	9 30	4 34	7 34	2 46	6 16	4 40	7 28	2 50
7	F	22 33 7	4 29	7 39	3 33	10 21	4 34	7 34	3 37	7 7	4 40	7 28	3 42
8	S	22 26 20	4 30	7 38	rises.	11 6	4 35	7 33	rises.	7 52	4 41	7 27	rises.
9	A	22 19 9	4 31	7 38	7 58	11 54	4 36	7 33	7 55	8 40	4 42	7 27	7 52
10	M	22 11 36	4 31	7 38	8 38	ev.43	4 37	7 33	8 36	9 29	4 42	7 27	8 33
11	T	22 3 39	4 32	7 37	9 14	1 28	4 38	7 32	9 13	10 14	4 43	7 26	9 12
12	W	21 55 20	4 33	7 37	9 49	2 12	4 39	7 32	9 49	10 58	4 44	7 26	9 48
13	T	21 46 38	4 34	7 36	10 25	3 1	4 39	7 31	10 26	11 47	4 45	7 25	10 26
14	F	21 37 34	4 35	7 36	10 59	3 53	4 40	7 31	11 1	ev.39	4 45	7 25	11 2
15	S	21 28 8	4 36	7 35	11 47	4 50	4 41	7 30	11 50	1 36	4 46	7 24	11 42
16	A	21 18 19	4 37	7 34	morn	5 51	4 42	7 29	morn	2 37	4 47	7 24	morn
17	M	21 8 9	4 38	7 34	0 18	6 58	4 43	7 29	0 21	3 44	4 48	7 23	0 24
18	T	20 57 37	4 39	7 33	1 3	7 2	4 43	7 28	1 6	4 48	4 49	7 23	1 11
19	W	20 46 45	4 39	7 32	1 53	8 5	4 44	7 27	1 57	5 51	4 50	7 22	2 1
20	T	20 35 31	4 40	7 32	2 47	9 1	4 45	7 27	2 51	6 47	4 50	7 22	2 56
21	F	20 23 56	4 41	7 31	3 55	10 51	4 46	7 26	3 59	7 37	4 51	7 21	4 3
22	S	20 12 0	4 42	7 30	sets.	11 33	4 47	7 25	sets.	8 19	4 52	7 20	sets.
23	A	19 49 45	4 43	7 29	7 44	morn	4 48	7 24	7 41	9 4	4 53	7 19	7 39
24	M	19 47 9	4 44	7 28	8 18	0 18	4 49	7 23	8 16	9 44	4 53	7 18	8 14
25	T	19 34 14	4 45	7 27	8 48	0 58	4 49	7 22	8 47	10 22	4 54	7 17	8 46
26	W	19 20 59	4 46	7 26	9 16	1 36	4 50	7 22	9 16	10 58	4 55	7 16	9 16
27	T	19 7 25	4 47	7 25	9 44	2 12	4 51	7 21	9 45	11 38	4 56	7 15	9 46
28	F	18 53 32	4 48	7 24	10 13	2 52	4 52	7 20	10 15	morn	4 56	7 14	10 16
29	S	18 39 21	4 49	7 23	10 42	3 34	4 53	7 19	10 44	0 20	4 57	7 14	10 47
30	A	18 24 51	4 50	7 22	11 15	4 19	4 54	7 18	11 18	1 5	4 58	7 14	11 21
31	M	18 10 3	4 51	7 21	11 52	5 9	4 55	7 17	11 56	1 55	4 59	7 13	12 0

FROST AND SNOW.—Occasionally in Lapland the phenomenon of the formation of snow is witnessed when the door of an apartment in which persons are assembled is suddenly opened and a blast of cold air admitted, the watery vapor exhaled by their respiration being instantly frozen into flakes. Snow is a bad conductor of heat, or cold, and therefore acts as a most valuable covering for vegetables and seeds; wheat continues to grow beneath its covering, though every blade would be cut off if exposed to the frosty air. Let ns not forget how beautiful and varied are the forms of its flakes, when looked at through a magnifying glass, or microscope.

8th MONTH. AUGUST, 1865. 31 DAYS.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
FULL MOON, ········	7	0 45 mo.	0 33 mo.	0 23 mo.	1	12 6 1
THIRD QUARTER, ····	13	4 58 ev.	4 46 ev.	4 36 ev.	9	12 5 12
NEW MOON, · ·······	21	2 33 mo.	2 21 mo.	2 11 mo.	17	12 3 41
FIRST QUARTER, ····	29	7 2 mo.	6 50 mo.	6 40 mo.	25	12 1 49

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon. SUN rises	SUN sets.	MOON sets.	H. W. Bost.	CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois. SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virg's, Kent'y, Miss'ri, and California. SUN rises	SUN sets.	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	17 54 57	4 52	7 20	morn	6 4	4 56	7 16	morn	2 50	5 0	7 12	morn
2	W	17 39 34	4 53	7 19	0 35	7 2	4 57	7 15	0 39	3 48	5 1	7 11	0 43
3	T	17 23 54	4 54	7 18	1 23	8 2	4 58	7 14	1 27	4 48	5 2	7 10	1 31
4	F	17 7 57	4 55	7 16	2 17	9 2	4 59	7 13	2 21	5 48	5 2	7 9	2 25
5	S	16 51 43	4 56	7 15	3 17	9 57	5 0	7 12	3 20	6 43	5 3	7 8	3 24
6	A	16 35 12	4 57	7 14	rises.	10 49	5 1	7 11	rises.	7 35	5 4	7 7	rises.
7	M	16 18 26	4 58	7 13	7 14	11 33	5 2	7 10	7 12	8 19	5 5	7 6	7 10
8	T	16 1 24	4 59	7 11	7 51	ev.24	5 3	7 9	7 50	9 10	5 6	7 4	7 49
9	W	15 44 6	5 0	7 10	8 25	1 10	5 4	7 8	8 25	9 56	5 7	7 3	8 26
10	T	15 26 33	5 1	7 9	9 8	1 53	5 5	7 6	9 4	10 39	5 8	7 1	9 15
11	F	15 8 46	5 2	7 8	9 40	2 41	5 6	7 5	9 42	11 27	5 9	7 0	9 44
12	S	14 50 43	5 3	7 7	10 19	3 35	5 7	7 3	10 22	ev.21	5 10	6 59	10 25
13	A	14 32 26	5 4	7 5	11 2	4 33	5 8	7 2	11 6	1 19	5 11	6 58	11 10
14	M	14 13 56	5 5	7 4	11 52	5 34	5 9	7 0	11 56	2 20	5 12	6 57	12 0
15	T	13 55 11	5 6	7 2	morn	6 42	5 10	6 59	morn	3 28	5 13	6 55	morn
16	W	13 36 14	5 7	7 1	0 43	7 45	5 11	6 58	0 57	4 31	5 14	6 54	0 51
17	T	13 17 3	5 8	7 0	1 39	8 48	5 12	6 57	1 44	5 34	5 15	6 53	1 47
18	F	12 57 39	5 9	6 58	2 37	9 42	5 13	6 55	2 41	6 28	5 16	6 52	2 45
19	S	12 38 4	5 10	6 56	3 37	10 29	5 14	6 54	3 40	7 15	5 17	6 50	3 43
20	A	12 18 16	5 11	6 55	4 36	11 9	5 15	6 53	4 38	7 55	5 18	6 49	4 41
21	M	11 58 16	5 12	6 54	sets.	11 48	5 16	6 51	sets.	8 34	5 19	6 48	sets.
22	T	11 38 5	5 14	6 52	7 17	morn	5 17	6 50	7 17	9 14	5 20	6 46	7 17
23	W	11 17 43	5 15	6 51	7 47	0 28	5 18	6 49	7 47	9 50	5 21	6 45	7 48
24	T	10 57 11	5 16	6 49	8 16	1 4	5 19	6 47	8 18	10 25	5 21	6 43	8 19
25	F	10 36 27	5 17	6 48	8 45	1 39	5 20	6 45	8 47	11 2	5 22	6 42	8 49
26	S	10 15 34	5 18	6 46	9 18	2 16	5 21	6 43	9 20	11 43	5 23	6 41	9 23
27	A	9 54 31	5 19	6 44	9 51	2 57	5 22	6 41	9 55	morn	5 24	6 39	9 58
28	M	9 33 19	5 20	6 42	10 30	3 42	5 23	6 40	10 34	0 28	5 25	6 38	10 38
29	T	9 11 58	5 21	6 41	11 14	4 33	5 24	6 38	11 18	1 19	5 26	6 36	11 22
30	W	8 50 28	5 22	6 39	morn	5 28	5 25	6 36	morn	2 14	5 27	6 34	morn
31	T	8 28 50	5 23	6 37	0 4	6 28	5 26	6 34	0 8	3 14	5 28	6 33	0 12

WHIRLWINDS sometimes arise from winds blowing among lofty and precipitous mountains, the form of which influences their direction, and occasions gusts to descend with a spiral or whirling motion. They are frequently, however, caused by two winds meeting each other at an angle, and then turning upon a center. When two winds thus encounter one another, any cloud which happens to be between them is of course condensed, and turned rapidly around; and all substances sufficiently light are carried up into the air by the whirling motion which ensues. The action of a whirlwind at sea occasions the curious phenomenon called a *water-spout.*

9th MONTH. # SEPTEMBER, 1865. **30 DAYS.**

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
FULL MOON,	5	9 8 mo.	8 56 mo.	8 46 mo.	1	11 59 45
THIRD QUARTER,	11	0 14 mo.	0 2 mo.	11 52 ev.	9	11 57 5
NEW MOON,	19	6 1 ev.	5 49 ev.	5 39 ev.	17	11 54 17
FIRST QUARTER,	27	10 2 ev.	9 50 ev.	9 40 ev.	25	11 51 31

			CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Mary'ld, Virg'a, Kent'y, Miss'ri, and California.		
DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.	SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets.	MOON sets.
		° ' "	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	F	8 7 3	5 24	6 36	1 1	7 31	5 27	6 33	1 4	4 17	5 29	6 31	1 9
2	S	7 45 9	5 26	6 35	2 3	8 33	5 28	6 32	2 6	5 19	5 30	6 30	2 10
3	A	7 23 7	5 27	6 33	3 9	9 32	5 29	6 30	3 11	6 18	5 31	6 28	3 14
4	M	7 0 58	5 28	6 31	4 18	10 25	5 30	6 29	4 20	7 11	5 32	6 27	4 22
5	T	6 38 42	5 29	6 30	rises.	11 11	5 31	6 27	rises.	7 57	5 33	6 25	rises.
6	W	6 16 19	5 30	6 28	6 59	12 0	5 32	6 26	7 0	8 46	5 34	6 24	7 1
7	T	5 53 50	5 31	6 26	7 36	ev.49	5 33	6 24	7 38	9 35	5 35	6 23	7 40
8	F	5 31 16	5 32	6 25	8 18	1 32	5 34	6 23	8 21	10 18	5 35	6 21	8 24
9	S	5 8 35	5 33	6 23	9 1	2 24	5 35	6 21	9 5	11 10	5 36	6 20	9 8
10	A	4 45 50	5 34	6 21	9 50	3 18	5 36	6 19	9 53	ev. 4	5 37	6 18	9 58
11	M	4 22 59	5 35	6 19	10 40	4 17	5 36	6 18	10 32	1 3	5 38	6 17	10 48
12	T	3 59 64	5 36	6 17	11 36	5 18	5 37	6 16	11 40	2 4	5 39	6 15	11 45
13	W	3 37 4	5 37	6 16	morn	6 24	5 38	6 14	morn	3 10	5 40	6 13	morn
14	T	3 14 0	5 38	6 14	0 33	7 26	5 39	6 12	0 37	4 12	5 40	6 12	0 41
15	F	2 50 53	5 39	6 12	1 31	8 23	5 40	6 10	1 34	5 9	5 41	6 10	1 37
16	S	2 27 42	5 40	6 11	2 31	9 16	5 41	6 8	2 33	6 2	5 42	6 9	2 36
17	A	2 4 28	5 41	6 9	3 13	10 1	5 42	6 7	3 17	6 47	5 43	6 7	3 21
18	M	1 41 12	5 42	6 7	4 26	10 42	5 43	6 5	4 27	7 28	5 44	6 5	4 28
19	T	1 17 53	5 43	6 5	5 24	11 18	5 44	6 4	5 24	8 4	5 44	6 4	5 24
20	W	0 54 32	5 44	6 4	sets.	11 55	5 45	6 2	sets.	8 41	5 45	6 2	sets.
21	T	0 31 10	5 45	6 2	6 47	morn	5 46	6 1	6 49	9 20	5 46	6 1	6 51
22	F	0 7 47	5 46	6 0	7 18	0 34	5 47	5 59	7 21	9 56	5 47	5 59	7 23
23	S	S. 15 38	5 47	5 58	7 51	1 10	5 48	5 57	7 54	10 33	5 48	5 57	7 57
24	A	0 39 2	5 48	5 56	8 28	1 47	5 49	5 55	8 32	11 12	5 49	5 55	8 36
25	M	1 2 27	5 49	5 54	9 10	2 26	5 50	5 53	9 14	11 58	5 50	5 53	9 18
26	T	1 25 52	5 50	5 52	9 56	3 12	5 51	5 52	10 0	morn	5 51	5 52	10 4
27	W	1 49 16	5 51	5 50	10 48	4 2	5 52	5 50	10 52	0 48	5 52	5 51	10 56
28	T	2 12 39	5 53	5 49	11 46	4 57	5 53	5 49	11 50	1 43	5 53	5 49	11 54
29	F	2 36 1	5 54	5 46	morn	5 57	5 54	5 47	morn	2 43	5 54	5 47	morn
30	S	2 59 22	5 55	5 45	0 49	7 1	5 55	5 45	0 52	3 47	5 55	5 45	0 55

HURRICANES--Have been supposed to be of electric origin. A large vacuum is suddenly created in the atmosphere, into which the surrounding air rushes with immense rapidity, sometimes from opposite points of the compass, spreading the most frightful devastation along its track, rooting up trees, and levelling houses with the ground. They are seldom experienced beyond the tropics, or nearer the equator than the 9th or 10th parallels of latitude; and they rage with the greatest fury near the tropics, in the vicinity of land or islands, while far out in the open ocean they rarely occur. They are most common among the West India Islands, near the east coast of Madagascar, in the islands of Mauritius and Bourbon, in the Bay of Bengal, at the changing of the monsoons, and on the coast of China.

8th MONTH. AUGUST, 1865. 31 DAYS.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H.	M.	S.
FULL MOON,·········	7	0 45 mo.	0 33 mo.	0 23 mo.	1	12	6	1
THIRD QUARTER,····	13	4 58 ev.	4 46 ev.	4 36 ev.	9	12	5	12
NEW MOON,· ·······	21	2 33 mo.	2 21 mo.	2 11 mo.	17	12	3	41
FIRST QUARTER,·····	29	7 2 mo.	6 50 mo.	6 40 mo.	25	12	1	49

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets.	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	17 54 57	4 52	7 20	morn	6 4	4 56	7 16	morn	2 50	5 0	7 12	morn
2	W	17 39 34	4 53	7 19	0 35	7 2	4 57	7 15	0 39	3 48	5 1	7 11	0 43
3	T	17 23 54	4 54	7 18	1 23	8 2	4 58	7 14	1 27	4 48	5 2	7 10	1 31
4	F	17 7 57	4 55	7 16	2 17	9 2	4 59	7 13	2 21	5 48	5 2	7 9	2 25
5	S	16 51 43	4 56	7 15	3 17	9 57	5 0	7 12	3 20	6 43	5 3	7 8	3 24
6	A	16 35 12	4 57	7 14	rises.	10 49	5 1	7 11	rises.	7 35	5 4	7 7	rises.
7	M	16 18 26	4 58	7 13	7 14	11 33	5 2	7 10	7 12	8 19	5 5	7 6	7 10
8	T	16 1 24	4 59	7 11	7 51	ev.24	5 3	7 9	7 50	9 10	5 6	7 4	7 49
9	W	15 44 6	5 0	7 10	8 25	1 10	5 4	7 8	8 25	9 56	5 7	7 3	8 26
10	T	15 26 33	5 1	7 9	9 8	1 53	5 5	7 6	9 4	10 39	5 8	7 1	9 15
11	F	15 8 46	5 2	7 8	9 40	2 41	5 6	7 5	9 42	11 27	5 9	7 0	9 44
12	S	14 50 43	5 3	7 7	10 19	3 35	5 7	7 3	10 22	ev.21	5 10	6 59	10 25
13	A	14 32 26	5 4	7 5	11 2	4 33	5 8	7 2	11 6	1 19	5 11	6 58	11 10
14	M	14 13 56	5 5	7 4	11 52	5 34	5 9	7 0	11 56	2 20	5 12	6 57	12 0
15	T	13 55 11	5 6	7 2	morn	6 42	5 10	6 59	morn	3 28	5 13	6 55	morn
16	W	13 36 14	5 7	7 1	0 43	7 45	5 11	6 58	0 57	4 31	5 14	6 54	0 51
17	T	13 17 3	5 8	7 0	1 39	8 48	5 12	6 57	1 44	5 34	5 15	6 53	1 47
18	F	12 57 39	5 9	6 58	2 37	9 42	5 13	6 55	2 41	6 28	5 16	6 52	2 45
19	S	12 38 4	5 10	6 56	3 37	10 29	5 14	6 54	3 40	7 15	5 17	6 50	3 43
20	A	12 18 16	5 11	6 55	4 36	11 9	5 15	6 53	4 38	7 55	5 18	6 49	4 41
21	M	11 58 16	5 12	6 54	sets.	11 48	5 16	6 51	sets.	8 34	5 19	6 48	sets.
22	T	11 38 5	5 14	6 52	7 17	morn	5 17	6 50	7 17	9 14	5 20	6 46	7 17
23	W	11 17 43	5 15	6 51	7 47	0 28	5 18	6 49	7 47	9 50	5 21	6 45	7 48
24	T	10 57 11	5 16	6 49	8 16	1 4	5 19	6 47	8 18	10 25	5 21	6 43	8 19
25	F	10 36 27	5 17	6 48	8 45	1 39	5 20	6 45	8 47	11 2	5 22	6 42	8 49
26	S	10 15 34	5 18	6 46	9 18	2 16	5 21	6 43	9 20	11 43	5 23	6 41	9 23
27	A	9 54 31	5 19	6 44	9 51	2 57	5 22	6 41	9 55	morn	5 24	6 39	9 58
28	M	9 33 19	5 20	6 42	10 30	3 42	5 23	6 40	10 34	0 28	5 25	6 38	10 38
29	T	9 11 58	5 21	6 41	11 14	4 33	5 24	6 38	11 18	1 19	5 26	6 36	11 22
30	W	8 50 28	5 22	6 39	morn	5 28	5 25	6 36	morn	2 14	5 27	6 34	morn
31	T	8 28 50	5 23	6 37	0 4	6 28	5 26	6 34	0 8	3 14	5 28	6 33	0 12

WHIRLWINDS sometimes arise from winds blowing among lofty and precipitous mountains, the form of which influences their direction, and occasions gusts to descend with a spiral or whirling motion. They are frequently, however, caused by two winds meeting each other at an angle, and then turning upon a center. When two winds thus encounter one another, any cloud which happens to be between them is of course condensed, and turned rapidly around; and all substances sufficiently light are carried up into the air by the whirling motion which ensues. The action of a whirlwind at sea occasions the curious phenomenon called a *water-spout*.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
Full Moon,	5	9 8 mo.	8 56 mo.	8 46 mo.	1	11 59 45
Third Quarter,	11	0 14 mo.	0 2 mo.	11 52 ev.	9	11 57 5
New Moon,	19	6 1 ev.	5 49 ev.	5 39 ev.	17	11 54 17
First Quarter,	27	10 2 ev.	9 50 ev.	9 40 ev.	25	11 51 31

Day of Month.	Day of Week.	Sun's Declens. N.	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Mary'ld, Virg'a, Kent'y, Miss'ri, and California.		
			Sun rises.	Sun sets.	Moon sets.	H. W. Bost.	Sun rises.	Sun sets.	Moon sets.	H. W. N. Y.	Sun rises.	Sun sets.	Moon sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	F	8 7 3	5 24	6 36	1 1	7 31	5 27	6 33	1 4	4 17	5 29	6 31	1 9
2	S	7 45 9	5 26	6 35	2 3	8 33	5 28	6 32	2 6	5 19	5 30	6 30	2 10
3	A	7 23 7	5 27	6 33	3 9	9 32	5 29	6 30	3 11	6 18	5 31	6 28	3 14
4	M	7 0 58	5 28	6 31	4 18	10 25	5 30	6 29	4 20	7 11	5 32	6 27	4 22
5	T	6 38 42	5 29	6 30	rises.	11 11	5 31	6 27	rises.	7 57	5 33	6 25	rises.
6	W	6 16 19	5 30	6 28	6 59	12 0	5 32	6 26	7 0	8 46	5 34	6 24	7 1
7	T	5 53 50	5 31	6 26	7 36	ev.49	5 33	6 24	7 38	9 35	5 35	6 23	7 40
8	F	5 31 16	5 32	6 25	8 18	1 32	5 34	6 23	8 21	10 18	5 35	6 21	8 24
9	S	5 8 35	5 33	6 23	9 1	2 24	5 35	6 21	9 5	11 10	5 36	6 20	9 8
10	A	4 45 50	5 34	6 21	9 50	3 18	5 36	6 19	9 53	ev. 4	5 37	6 18	9 58
11	M	4 22 59	5 35	6 19	10 40	4 17	5 36	6 18	10 32	1 3	5 38	6 17	10 48
12	T	3 59 64	5 36	6 17	11 36	5 18	5 37	6 16	11 40	2 4	5 39	6 15	11 45
13	W	3 37 4	5 37	6 16	morn	6 24	5 38	6 14	morn	3 10	5 40	6 13	morn
14	T	3 14 0	5 38	6 14	0 33	7 26	5 39	6 12	0 37	4 12	5 40	6 12	0 41
15	F	2 50 53	5 39	6 12	1 31	8 23	5 40	6 10	1 34	5 9	5 41	6 10	1 37
16	S	2 27 42	5 40	6 11	2 31	9 16	5 41	6 8	2 33	6 2	5 42	6 9	2 36
17	A	2 4 28	5 41	6 9	3 13	10 1	5 42	6 7	3 17	6 47	5 43	6 7	3 21
18	M	1 41 12	5 42	6 7	4 26	10 42	5 43	6 5	4 27	7 28	5 44	6 5	4 28
19	T	1 17 53	5 43	6 5	5 24	11 18	5 44	6 4	5 24	8 4	5 44	6 4	5 24
20	W	0 54 32	5 44	6 4	sets.	11 55	5 45	6 2	sets.	8 41	5 45	6 2	sets.
21	T	0 31 10	5 45	6 2	6 47	morn	5 46	6 1	6 49	9 20	5 46	6 1	6 51
22	F	0 7 47	5 46	6 0	7 18	0 34	5 47	5 59	7 21	9 56	5 47	5 59	7 23
23	S	S. 15 38	5 47	5 58	7 51	1 10	5 48	5 57	7 54	10 33	5 48	5 57	7 57
24	A	0 39 2	5 48	5 56	8 28	1 47	5 49	5 55	8 32	11 12	5 49	5 55	8 36
25	M	1 2 27	5 49	5 54	9 10	2 26	5 50	5 53	9 14	11 58	5 50	5 53	9 18
26	T	1 25 52	5 50	5 52	9 56	3 12	5 51	5 52	10 0	morn	5 51	5 52	10 4
27	W	1 49 16	5 51	5 50	10 48	4 2	5 52	5 50	10 52	0 48	5 52	5 51	10 56
28	T	2 12 39	5 53	5 49	11 46	4 57	5 53	5 49	11 50	1 43	5 53	5 49	11 54
29	F	2 36 1	5 54	5 46	morn	5 57	5 54	5 47	morn	2 43	5 54	5 47	morn
30	S	2 59 22	5 55	5 45	0 49	7 1	5 55	5 45	0 52	3 47	5 55	5 45	0 55

Hurricanes--Have been supposed to be of electric origin. A large vacuum is suddenly created in the atmosphere, into which the surrounding air rushes with immense rapidity, sometimes from opposite points of the compass, spreading the most frightful devastation along its track, rooting up trees, and levelling houses with the ground. They are seldom experienced beyond the tropics, or nearer the equator than the 9th or 10th parallels of latitude; and they rage with the greatest fury near the tropics, in the vicinity of land or islands, while far out in the open ocean they rarely occur. They are most common among the West India Islands, near the east coast of Madagascar, in the islands of Mauritius and Bourbon, in the Bay of Bengal, at the changing of the monsoons, and on the coast of China.

10th MONTH. **OCTOBER, 1865.** **31 DAYS.**

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
Full Moon,	4	5 47 ev.	5 35 ev.	5 25 ev.	1	11 49 32
Third Quarter,	11	10 38 mo.	10 26 mo.	10 16 mo.	9	11 47 11
New Moon,	19	11 43 mo.	11 31 mo.	11 21 mo.	17	11 45 20
First Quarter,	27	11 6 mo.	10 54 mo.	10 44 mo.	25	11 44 8

Day of Month.	Day of Week.	Sun's declens. S.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon. Sun rises	Sun sets.	Moon sets.	H. W. Bost.	CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois. Sun rises	Sun sets.	Moon sets.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. Sun rises	Sun sets.	Moon sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	A	3 22 40	5 56	5 43	1 55	8 3	5 56	5 43	1 57	4 49	5 56	5 44	2 0
2	M	3 45 56	5 57	5 42	3 5	9 3	5 57	5 42	3 6	5 49	5 57	5 42	3 7
3	T	4 9 10	5 58	5 40	4 17	9 59	5 58	5 41	4 17	6 45	5 58	5 41	4 18
4	W	4 32 21	5 59	5 39	rises.	10 50	5 59	5 39	rises.	7 36	5 59	5 39	rises.
5	T	4 55 28	6 1	5 38	6 9	11 36	6 0	5 37	6 12	8 22	6 0	5 38	6 14
6	F	5 18 32	6 2	5 36	6 53	ev.29	6 1	5 36	6 56	9 15	6 1	5 37	6 59
7	S	5 41 31	6 3	5 34	7 40	1 19	6 2	5 34	7 44	10 5	6 2	5 35	7 47
8	A	6 4 27	6 4	5 33	8 33	2 6	6 3	5 33	8 38	10 52	6 3	5 34	8 42
9	M	6 27 17	6 5	5 31	9 28	3 2	6 4	5 31	9 32	11 48	6 4	5 32	9 36
10	T	6 50 3	6 6	5 29	10 25	3 59	6 5	5 29	10 29	ev.45	6 5	5 31	10 34
11	W	7 12 43	6 8	5 28	11 25	4 58	6 6	5 28	11 28	1 44	6 6	5 30	11 32
12	T	7 35 17	6 9	5 26	morn	5 57	6 7	5 26	morn	2 43	6 7	5 29	morn
13	F	7 57 45	6 10	5 24	0 24	6 57	6 8	5 25	0 27	3 43	6 8	5 27	0 30
14	S	8 20 7	6 11	5 22	1 23	7 51	6 9	5 23	1 25	4 37	6 9	5 25	1 27
15	A	8 42 22	6 12	5 20	2 20	8 42	6 10	5 22	2 21	5 28	6 10	5 24	2 23
16	M	9 4 29	6 13	5 19	3 17	9 25	6 11	5 20	3 18	6 11	6 11	5 22	3 19
17	T	9 26 29	6 14	5 17	4 13	10 9	6 12	5 19	4 13	6 55	6 12	5 20	4 13
18	W	9 48 20	6 15	5 16	5 9	10 48	6 13	5 17	5 8	7 34	6 13	5 19	5 7
19	T	10 10 3	6 17	5 14	sets.	11 23	6 14	5 16	sets.	8 9	6 14	5 17	sets.
20	F	10 31 37	6 18	5 13	5 53	morn	6 15	5 15	5 56	8 49	6 15	5 16	5 59
21	S	10 53 1	6 19	5 11	6 28	0 3	6 16	5 13	6 32	9 28	6 16	5 15	6 35
22	A	11 14 16	6 21	5 10	7 10	0 42	6 18	5 12	7 13	10 9	6 17	5 14	7 18
23	M	11 35 21	6 22	5 8	7 53	1 23	6 19	5 10	7 57	10 47	6 18	5 13	8 1
24	T	11 56 15	6 23	5 7	8 43	2 1	6 20	5 8	8 47	11 33	6 19	5 12	8 51
25	W	12 16 58	6 24	5 5	9 38	2 47	6 21	5 7	9 42	morn	6 20	5 10	9 46
26	T	12 37 29	6 25	5 4	10 37	3 37	6 22	5 5	10 41	0 23	6 21	5 9	10 44
27	F	12 57 49	6 27	5 2	11 40	4 31	6 24	5 4	11 42	1 17	6 22	5 7	11 45
28	S	13 17 57	6 28	5 1	morn	5 29	6 25	5 3	morn	2 15	6 23	5 5	morn
29	A	13 37 52	6 29	5 0	0 45	6 29	6 26	5 2	0 47	3 15	6 24	5 4	0 48
30	M	13 57 33	6 31	4 58	1 53	7 32	6 27	5 0	1 54	4 18	6 25	5 3	1 55
31	T	14 17 2	6 32	4 57	3 4	8 33	6 28	4 59	3 4	5 19	6 26	5 2	3 3

Change of Air.—Change of air is at all times one of the most important auxiliaries of the medical adviser. To persons confined in close towns, accustomed to sedentary employments, and suffering from the ailments incidental to such situations, and modes of life, a change to some open hilly district, or the breezy sea-side, often produces marvellous results; so with the poor invalid, attacked, perchance, by consumption, who finds the fresh breezes of the hills or the sea-shore too keen for the diseased lungs to breathe, for such, in some sheltered vale in the Floridas, and other Southern portions of our land, relief and enjoyment may be often found. In the low-lying, thickly-wooded rural districts the air is generally relax-

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington. H. M.	Sun on Merid. or noon mark. D.	H. M. S.
Full Moon,	3	3 19 mo.	3 7 mo.	5 57 mo.	1	11 43 42
Third Quarter,	10	1 1 mo.	0 49 mo.	0 39 mo.	9	11 44 0
New Moon,	18	6 16 mo.	6 4 mo.	5 54 mo.	17	11 45 13
First Quarter,	25	10 15 ev.	10 3 ev.	9 53 ev.	25	11 47 19

			CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Mary'ld, Virg'a, Kent'y, Miss'ri, and California.		
DAY OF MONTH.	DAY OF WEEK.	Sun's declens. S.	SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets.	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	W	14 36 17	6 33	4 55	4 16	9 33	6 29	4 59	4 15	6 19	6 27	5 1	4 14
2	T	14 55 17	6 34	4 54	5 28	10 27	6 30	4 58	5 26	7 13	6 28	5 0	5 24
3	F	15 14 3	6 35	4 53	rises.	11 17	6 31	4 57	rises.	8 3	6 29	4 59	rises.
4	S	15 32 34	6 36	4 52	6 19	ev. 9	6 32	4 56	6 22	8 55	6 30	4 58	6 26
5	A	15 50 50	6 37	4 50	7 14	1 2	6 33	4 55	7 18	9 48	6 31	4 57	7 22
6	M	16 8 49	6 39	4 49	8 13	1 51	6 35	4 53	8 17	10 37	6 32	4 56	8 21
7	T	16 26 33	6 40	4 48	9 13	2 41	6 36	4 52	9 17	11 27	6 33	4 55	9 21
8	W	16 44 0	6 41	4 47	10 15	3 36	6 38	4 50	10 18	ev.22	6 35	4 54	10 21
9	T	17 1 10	6 43	4 45	11 14	4 30	6 39	4 49	11 16	1 16	6 36	4 53	11 19
10	F	17 18 3	6 44	4 44	morn	5 22	6 40	4 48	morn	2 8	6 37	4 52	morn
11	S	17 34 37	6 45	4 43	0 12	6 17	6 41	4 47	0 14	3 3	6 39	4 51	0 15
12	A	17 50 54	6 47	4 42	1 11	7 9	6 43	4 46	1 12	3 55	6 40	4 50	1 12
13	M	18 6 52	6 48	4 41	2 6	7 59	6 44	4 45	2 6	4 45	6 41	4 49	2 6
14	T	18 22 31	6 49	4 40	3 4	8 48	6 45	4 44	3 3	5 34	6 42	4 48	3 2
15	W	18 37 51	6 51	4 39	3 59	9 33	6 47	4 43	3 57	6 19	6 43	4 47	3 56
16	T	18 52 51	6 52	4 38	4 56	10 16	6 48	4 42	4 54	7 2	6 44	4 46	4 51
17	F	19 7 31	6 53	4 37	5 53	10 55	6 49	4 41	5 50	7 41	6 45	4 46	5 47
18	S	19 21 50	6 54	4 36	sets.	11 34	6 50	4 40	sets.	8 20	6 46	4 45	sets.
19	A	19 35 49	6 55	4 36	5 50	morn	6 51	4 40	5 54	9 4	6 47	4 44	5 59
20	M	19 49 26	6 56	4 35	6 39	0 18	6 52	4 39	6 43	9 47	6 48	4 44	6 44
21	T	20 2 41	6 58	4 34	7 32	1 1	6 54	4 38	7 36	10 28	6 49	4 43	7 40
22	W	20 15 34	6 59	4 33	8 31	1 42	6 55	4 38	8 34	11 13	6 50	4 42	8 38
23	T	20 28 5	7 0	4 33	9 31	2 27	6 56	4 37	9 34	morn	6 51	4 42	9 37
24	F	20 40 13	7 1	4 32	10 34	3 15	6 57	4 36	10 36	0 1	6 52	4 41	10 39
25	S	20 51 58	7 3	4 31	11 39	4 6	6 58	4 36	11 40	0 52	6 53	4 41	11 42
26	A	21 3 19	7 4	4 31	morn	5 1	6 59	4 35	morn	1 47	6 54	4 41	morn
27	M	21 14 16	7 5	4 30	0 47	6 1	7 0	4 34	0 47	2 47	6 55	4 41	0 47
28	T	21 24 50	7 6	4 29	1 55	7 2	7 1	4 34	1 54	3 48	6 56	4 40	1 54
29	W	21 34 59	7 7	4 29	3 6	8 6	7 2	4 33	3 4	4 52	6 57	4 40	3 3
30	T	21 44 44	7 9	4 29	4 17	9 7	7 4	4 33	4 14	5 53	6 58	4 40	4 12

ing, and frequently laden with miasma; persons who are obliged to dwell there should get out upon the open hills as often as possible, and let the lungs play freely in the bracing air; those engaged in rural occupations are usually enabled to resist the enervating effects of the bad air which they inhale, although not always, as we see by the prevalence of ague and other fevers among them. After all, however, for purity of air, the country is far to be preferred to the town, and in most situations the rural population are more healthful than the urban.

As a general rule it may be noted that dry air is good, if not too dry; in which case it is likely to cause cracks and chaps in the skin, and to be loaded with minute particles of dust, which are injurious to the lungs.

12th MONTH. DECEMBER, 1865. **31 DAYS.**

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
Full Moon, ...	2	2 0 ev.	1 48 ev.	1 38 ev.	1	11 49 24
Third Quarter, ...	9	7 29 ev.	7 17 ev.	7 7 ev.	9	11 52 46
New Moon, ...	17	0 1 mo.	11 49 ev.	11 39 ev.	17	11 56 35
First Quarter, ...	25	7 47 mo.	7 35 mo.	7 25 mo.	25	12 0 34

Day of Month.	Day of Week.	Sun's declens. S.	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets.	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	F	21 54 3	7 10	4 29	5 28	10 6	7 5	4 34	5 25	6 52	6 59	4 40	5 22
2	S	22 2 57	7 11	4 29	rises.	11 0	7 6	4 34	rises.	7 46	7 0	4 39	rises.
3	A	22 11 26	7 12	4 28	5 53	11 51	7 7	4 34	5 57	8 37	7 1	4 39	6 1
4	M	22 19 28	7 13	4 28	6 55	ev.44	7 8	4 33	6 58	9 30	7 2	4 39	7 3
5	T	22 27 5	7 14	4 28	7 58	1 32	7 9	4 33	7 1	10 18	7 3	4 38	8 5
6	W	22 34 15	7 15	4 28	9 0	2 19	7 10	4 33	9 2	11 5	7 4	4 38	9 5
7	T	22 40 59	7 16	4 28	10 2	3 6	7 11	4 33	10 4	11 52	7 5	4 38	10 6
8	F	22 47 17	7 17	4 28	11 0	3 54	7 12	4 33	11 1	ev.40	7 6	4 38	11 2
9	S	22 53 7	7 18	4 28	11 58	4 43	7 13	4 33	11 58	1 29	7 7	4 38	11 59
10	A	22 58 30	7 19	4 28	morn	5 32	7 14	4 33	morn	2 18	7 8	4 38	morn
11	M	23 3 26	7 20	4 28	0 55	6 24	7 15	4 33	0 54	3 10	7 9	4 38	0 54
12	T	23 7 54	7 21	4 28	1 51	7 15	7 15	4 33	1 50	4 1	7 10	4 39	1 48
13	W	23 11 55	7 22	4 28	2 48	8 6	7 16	4 33	2 46	4 52	7 10	4 39	2 44
14	T	23 15 28	7 22	4 28	3 45	8 55	7 17	4 34	3 42	5 41	7 11	4 39	3 39
15	F	23 18 33	7 23	4 28	4 41	9 44	7 17	4 34	4 38	6 30	7 11	4 39	4 34
16	S	23 21 10	7 24	4 28	5 36	10 29	7 18	4 34	5 33	7 15	7 12	4 39	5 28
17	A	23 23 20	7 24	4 29	6 33	11 12	7 18	4 34	6 27	7 58	7 12	4 40	6 23
18	M	23 25 0	7 25	4 29	sets.	11 56	7 19	4 35	sets.	8 42	7 13	4 40	sets.
19	T	23 26 13	7 25	4 29	6 24	morn	7 19	4 35	6 27	9 27	7 13	4 40	6 31
20	W	23 26 58	7 26	4 30	7 23	0 41	7 20	4 36	7 27	10 12	7 14	4 41	7 30
21	T	23 27 14	7 26	4 30	8 27	1 26	7 20	4 36	8 30	10 52	7 14	4 41	8 32
22	F	23 27 2	7 27	4 31	9 32	2 6	7 21	4 37	9 34	11 39	7 15	4 42	9 35
23	S	23 26 21	7 27	4 31	10 37	2 53	7 21	4 37	10 38	morn	7 15	4 42	10 39
24	A	23 25 13	7 28	4 32	11 44	3 43	7 22	4 38	11 44	0 29	7 16	4 43	11 44
25	M	23 23 36	7 28	4 32	morn	4 38	7 22	4 38	morn	1 24	7 16	4 43	morn
26	T	23 21 31	7 29	4 33	0 52	5 34	7 23	4 39	0 51	2 20	7 17	4 44	0 50
27	W	23 18 57	7 29	4 34	2 2	6 39	7 23	4 39	1 59	3 25	7 17	4 45	1 57
28	T	23 15 56	7 29	4 34	3 9	7 42	7 24	4 40	3 6	4 28	7 18	4 45	3 3
29	F	23 12 27	7 29	4 35	4 18	8 48	7 24	4 40	4 14	5 34	7 18	4 46	4 10
30	S	23 8 29	7 30	4 36	5 23	9 50	7 25	4 41	5 19	6 36	7 19	4 47	5 15
31	A	23 4 4	7 30	4 37	6 24	10 45	7 25	4 42	6 20	7 31	7 19	4 48	6 16

Moist air is not healthy to breathe, especially if accompanied by cold, as it often is in this climate; hence the prevalence of pulmonary diseases. The air of the coast, if not too keen, is undoubtedly stimulating and strengthening, in a great measure owing, probably, to its containing a portion of the marine constituents; there is a healthful freshness in the very play and dash of the waves, and the lungs seem to inhale larger quantities of the atmosphere, and to expand more freely, by the margin of the wide ocean; here that indispensable condition of atmospheric purity, constant motion, ever prevails, as it does usually upon great elevations, hill-tops, and lofty table-lands, around and over which the gales sweep.

THE

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.

COUNTRY HOMES.*

A HOUSE is always a teacher; it may become an agent of civilization. While builders minister to deceit and vanity, those vices will prevail; when their works embody fitness, truth and dignified simplicity, these republican virtues will be firmly rooted in the nation. Few are aware how strong an influence is exerted by the dwelling on its inhabitants.

Mistakes in building are more often made through want of thought than lack of taste or means; still the consequences are equally serious.

To harmonize with the surrounding scenery, to enter into the spirit of the landscape, is the highest beauty of a domestic building. This is too often overlooked;—and we find the dignity and repose of Nature broken by the presence of white, bare, bleak abodes, set ostentatiously in unplanted fields. Flat roofs and horizontal lines are opposed to the ascending lines of rocks and mountains around them; lofty turrets and steep gables rise up to contradict the natural expression of level plains. A house may be considered beautiful in the situation which suits it; its precise copy, in an unfit place, will always be a miserable deformity.

* The plans and most of the matter of this article were furnished by an assistant.

Fashion is not the synonym of taste; nor is beauty monopolized by wealth. A low log-cabin, nestled in the woods, the moss grown over its roof, the morning-glories climbing to the rustic window, is more attractive and is a better home than many a costly marble mansion. But the effort of "putting the best foot foremost," and anxiously attempting much display, costs our country homes the truth, the comfort, the sobriety which ought to characterize their architecture.

No house can fail to please whose form and hue accord with the adjacent country; which looks just what it is, neither less nor more; whose proportions and details are formed upon the principles of taste; and whose inner arrangement regards economy of space and gives attention to the laws of health,—requiring the fewest steps, presenting the greatest cheerfulness, neatness and convenience for common and daily use. All which the poorest man who builds can have as well as the rich; for Providence opens a short road to comfort, but hedges up the path to luxury.

A SMALL COTTAGE.

This design, being intended for a respectable family of limited means, who desire a home of their own, however humble, has been supplied, to meet the wants of such, with every facility for refined domestic life; although, of course, in a small way.

There is but one large room for general family use, but this is furnished with a pantry 5 by 8 feet, and a platform adjoining the wood-house, where, in mild weather, much coarse work may be performed. From this the cellar stairs descend, directly under the flight to the upper story. The closet in

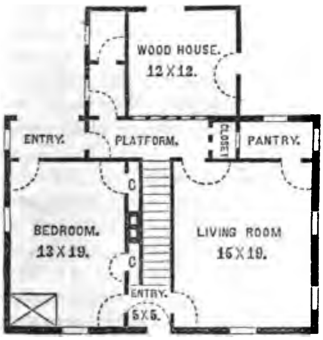


Fig. 3.—*First Floor.*

this platform may be constructed only three feet high, to contain iron ware, and the top of it can be used as a table for washing dishes. The sliding window in the pantry will allow the replacing of the dishes without taking them around through the living-room door. The platform being in the body of the house, is simply enclosed on its outer side by the studding of the walls—in this a door-way should be made to allow free access to the wood-house.

There is a large bed-room on the first floor, having two closets. (The place most suitable for the bed is marked by a parallelogram crossed by diagonal lines; and all the doors in this and the succeeding plans are marked with dotted lines, showing in what direction they should swing back.) The upper story is occupied by two bed-rooms and a bath-room. The garrets are obtained by enclosing the sloping space on each side of the chambers, thus leaving them of proper height throughout.

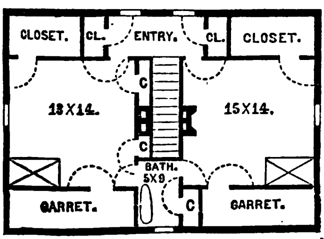


Fig. 4.—*Chamber Floor.*

The right hand chimney, rising only from the second floor, should be solidly supported by thick planks in that part of the floor where it stands, to prevent its settling. The stove-pipe from the living-room fire passes up into the room above to enter the chimney.

The body of the house is 25 by 34 feet, with a wing 12 by 17 feet.

Cost of Erection.—The cost of building in accordance with these designs will vary much with the degree of finish and price of materials, and the estimates furnished can be considered only as approximate ones. They are made, in all instances, on the basis of prices before the war, to which the requisite additions must be made in accordance with the increased rates. The estimates are also intended for wood—if built of stone or brick, nearly one-half more should be added, varying with localities.

The cost of a house built according to the preceding design, would be from twelve to fifteen hundred dollars.

A BRACKETED SQUARE HOUSE.

The building, plainly and neatly constructed of wood, and vertically boarded, would cost, before the war, eighteen hundred to two thousand dollars. It is thirty-three feet square and one story and a half in height; the lower story should be nine feet high, and the upper one five feet on the sides, when finished, and as much higher in the centre as desired.

On the first floor there is a parlor, bed-room, sitting-room and kitchen—the last two communicating by an entry from which the cellar stairs descend. Both bed-room and kitchen open into an entry with an outside door, whose left-hand side is occupied with shelves for kitchen use, or a sink or

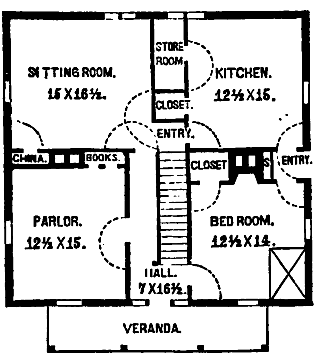


Fig. 6.—*First Floor.*

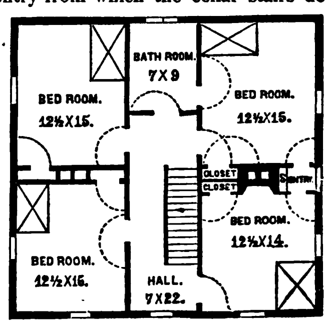


Fig. 7.—*Chamber Floor.*

the water-pump might be placed there, as the convenience of the family might most require.

The stairs which lead to the chambers are near the bed-room door—an advantage to the mistress of the house in case of sickness. The two right-hand rooms on the second floor are adapted to family use, one of them having a door into the bath-room, and both being connected by a lighted passage, with shelves on one side, as in the one below. All the bed-rooms are furnished with closets, and are nearly equal in size.

A PLAIN COUNTRY HOUSE.

This dwelling, neat and cheerful in its exterior, is 32 by 35 feet in size, and so simple in the arrangement of its rooms as to require little explanation.

The parlor and sitting room are entered by a small passage-way opening on the veranda in front. A side hall connects with the three principal rooms, and contains the stair-case. The kitchen is entered through the sitting-room, and has a pantry adjoining.

The upper rooms are equal in size to those below them, and are furnished with closets; between two of them a small bathing-room is situated. The recess, 5 by 8 feet, in the right-hand front bed-room, forms a pleasant place for sewing or study; or may be set off by a partition to form a separate room.

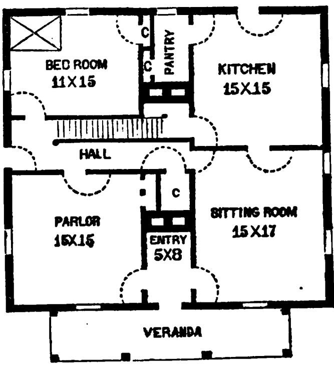


Fig. 9.—*First Floor.*

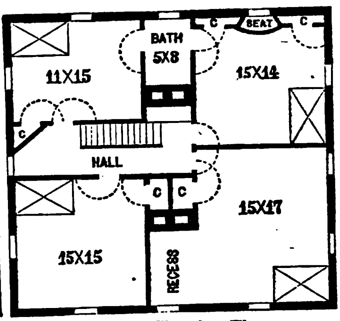
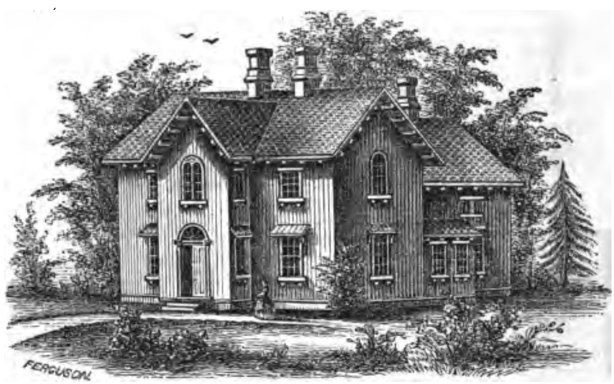


Fig. 10.—*Chamber Floor.*

The expense would be about the same as in the preceding design.



A CONVENIENT DWELLING.

The plan affords a parlor, sitting-room, kitchen and seven bed-rooms, and is adapted to the use of a large family residing in a country village or on a farm of moderate size.

The front porch may be fitted with glazed windows and a door in winter, in order to add to the warmth of the hall. The sitting or dining-

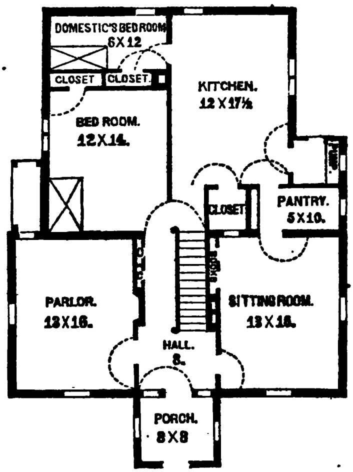


Fig. 12.—*First Floor.*

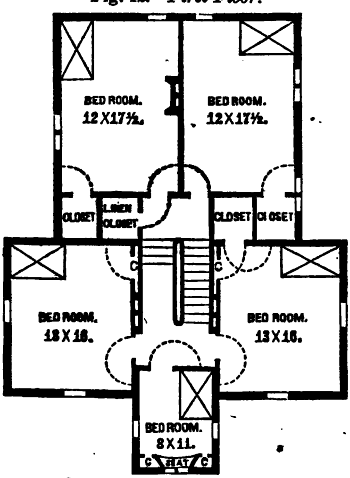


Fig. 13.—*Chamber Floor.*

room is separated from the kitchen by the pantry—an arrangement which is approved by all who have tried it; as it excludes much noise and smoke from the dining-room, while the pantry is accessible to both rooms at once.

The wing is not as high as the main part of the house in either story—the difference between the height of the lower rooms requiring that the bed-rooms in the upper story of the wing should be entered from the landing of the stairs; a few more steps lead to the upper hall and the front rooms.

There are several points in which this design may be modified to suit different tastes and requirements. Most persons would prefer a sliding window, or no connection at all, between the bed-room on the first floor and the kitchen. Some might wish a door in the parlor to open on the little back porch, instead of a window opening from the floor by weights and pulleys; or choose to employ the airy and pleasant little bed-room, 8 by 11, above stairs, as a study or sewing room. These changes are easily made.

The cost of this building would be about two thousand two hundred dollars.

[The engraving of the perspective view is defective in some particulars, but serves to give the general expression.]

A LARGE FARM-HOUSE.

In the erection of this class of dwellings, we need to strike a happy medium between the unsuitable and profuse adornment sometimes used, and

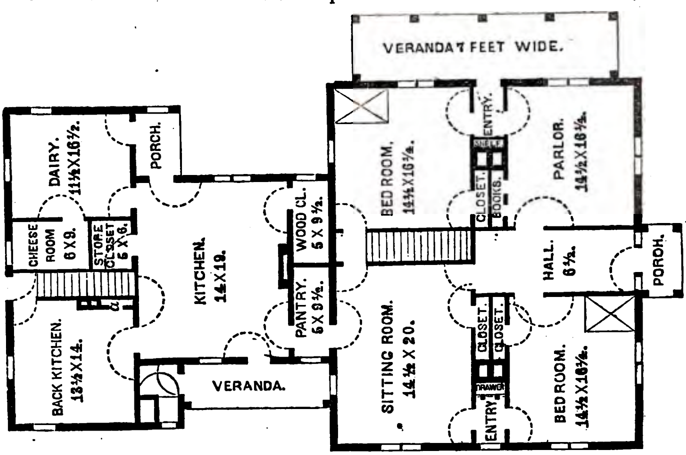


Fig. 15.—*First Floor.*

total disregard of taste and the neglect of every mental and social requirement. More of the real character of the country gentleman should be expressed—his culture without foppishness—honesty without rudeness.

Upon this principle the present design is believed to be based. While every facility for household labors is presented, there is scope offered for home comfort, intellectual improvement and wide hospitality.

The front rooms are so placed, that they must be more or less used by the family. The house consists of two buildings, a large one in front and a small one in the rear,—connected by the kitchen, which is only one story in height, with a lofty ceiling following up the slope of the rafters, so as to be high in the centre; lighted by windows on each side, and surrounded by all the closets, &c., required in domestic labor. The wood closet must be kept filled with wood, cut ready for use in a detached wood-house. The dairy or milk-room has an outer door of its own, and a large closet for keeping cheese. This closet is so situated that the odor of the cheese is not likely to fill the house. The cellar stairs are easily accessible from kitchen, dairy and back kitchen, and the stairs to the back chambers can be used by the hired men without their entering the other rooms, as the passage leading to them opens out-of-doors. The large and pleasant sitting-room is near the kitchen, the front stair-case and two bed-rooms. Some of the doors to the upper rooms should be partially glazed, to admit enough light to the upper hall; or the small bed-room might be omitted and the hall thus lighted by the front window. The four other bed-rooms are all large, of equal size, and furnished with ample closet-room. The upper room on the right hand, (being reached only by an entry,) is more retired than the rest, and would be comfortable and quiet for an invalid.

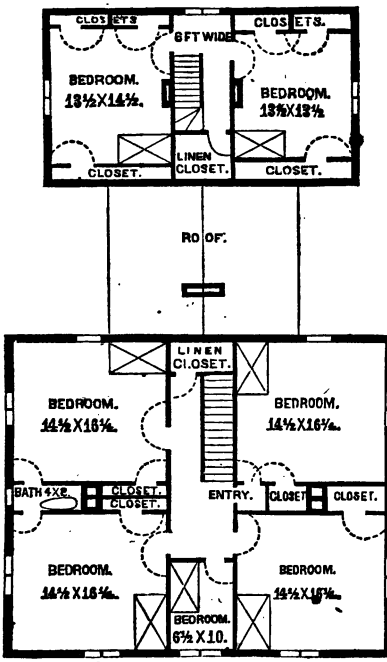


Fig. 16.—*Chamber Floor.*

The upper floor of the rear building is occupied by two good bed-rooms, for the use of domestics, &c., closets being made next to the eaves. A gable-window lights the space between the rooms. Cost, about $3,300.

A LARGE COUNTRY HOUSE.

The form of this design is a plain paralellogram, 40 by 43 feet, with a projection in front three feet deep, and verandas on both sides.

It is suited to the wants of a large and genteel family, who occupy it as a country residence. With considerable modification of plan, reduction in size, and built with a plain wooden exterior, it would answer the purposes of a country boarding-house.

The house is entered by a porch which opens into a large hall, with parlor on the right and dining-room on the left hand. The latter 16 by 19 feet, (misprinted 15 by 19,) contains a large bay window into which the dining-table may be extended if more room is needed. An enclosed porch, or arcade, is situated at the end of the staircase hall. If the cost of this feature is considered too great, the hall can extend to the outer wall of the house. The landing of the stairs looks out on the balcony; a few broad steps on the left hand lead to a retired chamber; the right hand steps to the upper hall. Five sleeping rooms, a bath-room and a number of closets fill up the second story. A servants' stair-case lands in

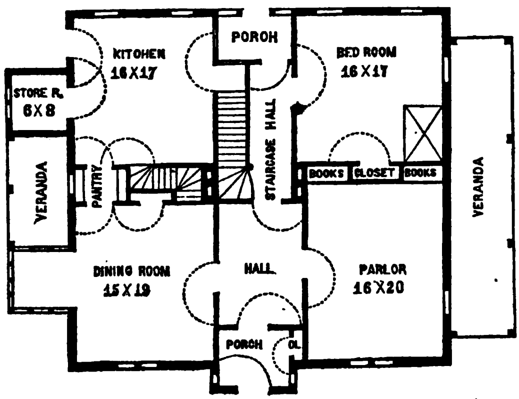


Fig. 17.—*First Floor.*

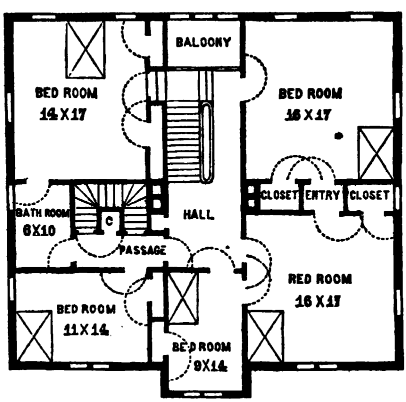


Fig. 18.—*Second Floor.*

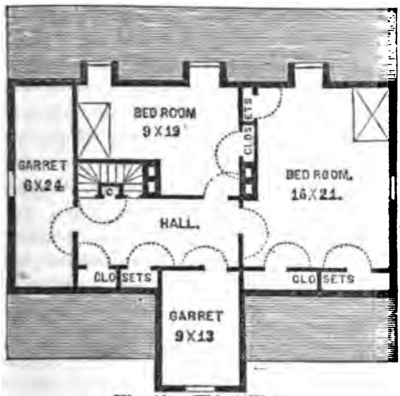


Fig. 19.—*Third Floor.*

the passage to the bath-room, and directly over this a flight ascends to their rooms in the attic. Here the steep rise of the roof affords ample space for two sleeping-rooms, lighted by dormer windows in the roof, and closet space and garrets besides.

The house is intended to be warmed by a furnace, but provision is made for heating with stoves all the lower and most of the upper apartments.

The cost of erecting this dwelling, before the war, would have been about $3,500, but the amount could have been considerably increased by a higher finish.

No elevation is given, but Design No. 10, of Vaux's Villas and Cottages indicates the general expression.

A VILLAGE RESIDENCE.

The plans and view* here given represent a residence erected some years ago in the village of Union Springs, N. Y. It is built of wood, with the walls filled in with brick.

The plans need but little explanation. A double door, (the outer a Venetian blind,) leads from the parlor to the veranda, in front of the ornamental garden, and commanding a view of Cayuga lake, half a mile distant. The nursery contains a series of drawers, set even with the wall, for containing miscellaneous articles. They are nineteen in number and placed in five series, one above another, the upper ones being small and the lower ones large. The bed-room between nursery and kitchen may be used as a bath-room, being readily accessible to the kitchen for obtaining heated water. The walls of the pantry are furnished with continuous shelves, all of which are closed with tight, narrow doors. A door about two feet square, breast high, between the dining-room and pantry, having a shelf a foot and a half wide on the pantry side, admits the free passage of dishes

* For the view, accurately copied from a photograph, see vignette, p. 129.

without opening the common door. A similar one is placed in the second story, between the room over the dining-room and the room for domestics over the kitchen, and proves a great convenience.

The observatory, shown in the perspective view, commands an extensive prospect, including many miles of Cayuga lake, the surrounding country and distant blue hills.

The basement is finished with a smooth floor of hydraulic cement, and is divided by eight-inch partitions into three

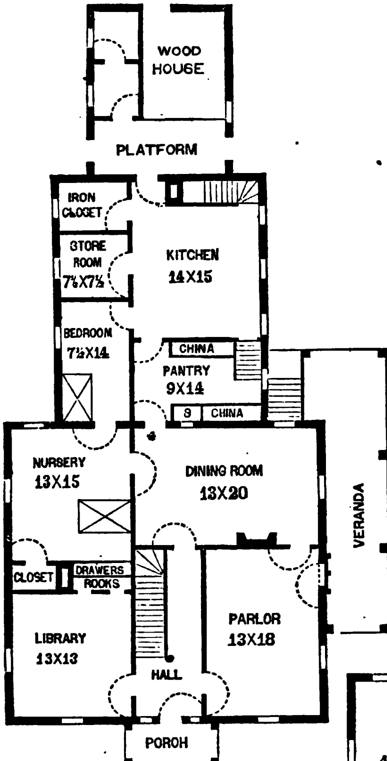


Fig. 20.—*Principal Floor.*

rooms, as shown in the annexed plan. The outer one contains a stone cistern about six by ten feet, from which the water is drawn through an inclined pipe by a pump in the kitchen placed over a stone sink. The same room is also used as a coal-cellar, and contains the hot-air furnace. Adjoining this is a room for the general purposes of a cellar. It contains a set of hanging

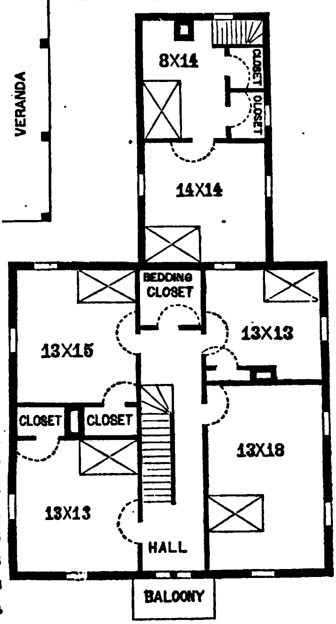


Fig. 21.—*Chamber Floor.*

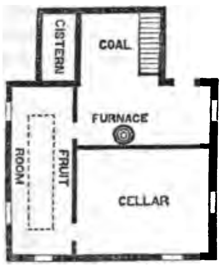
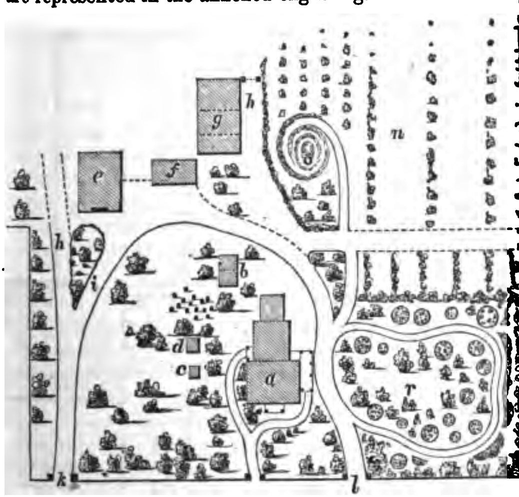


Fig. 22.—*Basement on reduced scale.*

shelves, a safe for articles of food, tight boxes for vegetables, &c., the latter being packed in fine damp moss. The third apartment is the fruit room, about twelve by twenty-eight feet. The shelves for containing the fruit are five and a half feet wide, and extend nearly the whole length of the apartment. The lower shelf is a foot from the floor, the other two with spaces of two feet between the shelves. The passage extending around allows free access for filling, picking over and selecting. The upper shelf being in a warmer stratum of air, should be furnished with lids to prevent evaporation and drying. Pears ripen finely on the lower shelves with a thick covering of woolen blankets.

This house stands on a small farm of about sixty acres, on one of the outer streets of the village, and the adjacent grounds of about two acres are represented in the annexed engraving. L is the carriage entrance from



the street, K the entrance to the farm and barns. R represents the ornamental garden, consisting of a closely shaved turf, through which the curved walk passes, and in which circular and irregular flower-beds are cut. Seats are placed under the trees and a summer-house in the remote corner. In the rear of this portion, and separated by an evergreen screen is the kitchen and fruit garden *n*, containing rows of dwarf apples, dwarf pears, and the smaller fruits, so arranged that the cultivation can be performed to a considerable extent by a horse. A natural depression at *o*, about thirty feet in diameter and eight feet deep, with a curved walk to the bottom, is planted as a secluded flower-garden. On the other side of the dwelling *a*,

and nearly hidden by trees, are the smoke-house *c*, the ice-house *d*, the children's play-room and tool-house *b*, and between them a group of bee-hives. The road *i*, extends to the carriage-shed *f*, and the horse-barn *e*, and *h h* to the orchard and farm—*g* represents the farm-barn.

The residence here represented, (built and occupied by the author of the Register,) was erected when materials were cheap, at a cost of a little over three thousand dollars. At the present increased prices nearly double this sum would be required.

A MONTHLY CALENDAR OF WORK,

FOR THE NURSERY, ORCHARD AND FRUIT-GARDEN.

The following pages are intended as a continuation of the calendar for farm work contained in the Register for 1864. The importance of doing work at its proper season, and of preventing the confusion and increase of labor occasioned by neglect and delay, it is believed will give particular value to these hints.

Work for January.

The labors for this month are not many, but some of them are of much importance. Where there is danger from mice, and the precaution of banking up was not performed in autumn, it will be advisable after each fall of snow to tread it firmly about the stem, which will exclude these depredators by preventing their burrowing. Where rabbits prove destructive, they are caught in traps; strewing corn near the trees will induce them to leave the trees for the corn.

Orchards and fruit-gardens should always be on naturally or artificially drained land—but it sometimes happens that a mid-winter thaw, accompanied with rain, will flood a young orchard, and subsequent hard freezing will injure the trees. Provision must therefore be made for surface draining, wherever accumulations of water occur.

Pruning.—Young trees in the nursery, and older ones in the orchard, of the hardier kinds, may be pruned during open weather. All wounds in orchard-trees, an inch or more in diameter, should be protected from the weather by a coating of ochre paint, shellac varnish, tar and brick-dust, or grafting wax. The surface should be allowed to remain uncovered a few days after the cut is made, in order to become dry. The neatest application is shellac dissolved to the consistency of thick paint in alcohol—the handle of the brush being inserted in the cork, it is kept air-tight in drying, and always ready, (fig. 24); but fine sand, brick-dust or powdered chalk, mixed with warm gas-tar, is a good application and much cheaper. Grafting wax

does well, and may be applied with a brush when melted, or in the form of thick plasters.

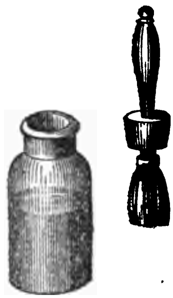


Fig. 1.—*Bottle of shellac and brush.*

Grafts may be cut and packed away for spring use. They should all be accurately and distinctly labelled, to prevent mistake; they may be packed in finely-broken, damp moss, or buried in earth—or if in small quantities, so as to prevent heating, in damp saw-dust. In cutting, the name may be kept temporarily by writing with a common lead pencil on a shaved portion of the shoot, (fig. 2); but for packing away permanently, write the name on both sides of a strip of shingle, say a foot long and half an inch wide, (fig. 3,) and tie this up with the scions, the outside writing readily showing the name, and the inner to refer to in case the outside is erased, (fig. 4). Scions not fully hardy, as of most sorts of plum, should be cut early in winter, or before they have been exposed and injured by severe cold. The new postage law allowing scions to be sent cheaply by mail, they are best put up by enclosing them air-tight in cases of oil-silk, (such as is used for hat-lining,) by wrapping the oil-silk about the scions and over the ends, and then passing a fine thread repeatedly round from end to end, making the whole air-tight, (fig. 28). The natural moisture is thus preserved, and they cannot shrivel. The names should be written with pencil on the ends, and no paper for this purpose wrapped around them, as it absorbs the moisture. Grafts have been shrivelled and spoiled by mistakenly placing dry cotton batting among them before being thus encased. To send grafts in larger quantities by "express," pack them in alternating layers of fine, slightly-damp moss. It is always important, whether packing grafts for keeping or for distant conveyance, to preserve the natural moisture precisely, and no more. If the packing is too wet, they will become water soaked and rot.

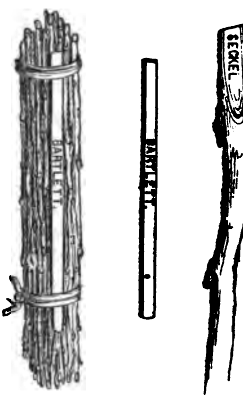


Fig. 4. Fig. 3. Fig. 2.
Marking and packing grafts.

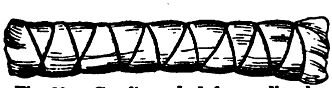


Fig. 28.—*Grafts packed for sending by mail.*

Excluding Cattle.—It should not be forgotten that where cattle run contiguously to orchards, serious damage is sometimes done by their break-

ing in at this season of the year—hence the importance of seeing that gates are kept closed, and fences in good repair.

Buying Trees.—Those intending to purchase trees in spring should now carefully ascertain where they can be procured with most certainty as to quality and kind. Never purchase of travelling venders, unless their character and that of their employers, are fully established; and above all, never take a tree of an unknown pedler, who has, perhaps, bought them, at low prices, of unreliable nurserymen, and, after drying them a week in the air, offers them as "very cheap." Where trees are to be obtained from a distance, send the order soon and avoid the false economy of trying to save expense by meagre packing. It is better to pay two or three cents per tree to have them well put up and to have them arrive in perfect condition, than half this amount and lose ten times the value in shrivelled trees.

Packing Trees.—Those who have trees themselves to pack for transportation in spring, should now see that the following materials are provided:—Boxes, with iron straps or hoops for the corners—moss, for the roots—straw, for the tops—labels, for designating the sorts—flag, oziers, or rye straw, for tying bunches—large labels of cloth, parchment or wood, for designating bunches—lamp-black, and turpentine or rock-oil, and brush for marking boxes. If the trees are to be packed in bales or bundles, provide long, straight rye or other straw—baling-cord—gunny-cloth or Russia mats—sewing-twine—large packing-needles—directing-labels—white-lead paint and soft pencil.

Manuring.—Orchards and fruit-gardens which need enriching should now receive a coat of manure, evenly spread over the whole surface, to be plowed or spaded in, in spring, if practicable; or if not, to be left on the surface, the soluble portions being carried into the soil by rains and melting snows. But caution should be used in placing much long manure against the stems of small trees, which might invite mice.

Registering Orchards.—Much inconvenience and often many mistakes arise from not preserving the names of varieties in young orchards. The trees are received, correctly labelled, from the nursery; these are left on the trees till the wires cut the limbs, or until effaced by time, and the sorts are forgotten. In a few years the trees begin to bear, but the names being gone the owner consults his neighbors, and probably receives very erroneous names, and thus misnomers are multiplied.

Forcing.—Full directions are not here intended, but only brief memoranda for hints in season. In forcing strawberries begin with a rather low temperature, or about 55°, and, as growth advances, gradually increase to 60° and 65°. Give a good supply of water uniformly at all times, and avoid flooding. It is important to preserve the moisture and temperature uniform, without sudden changes, or the buds will drop. Grapes for forcing now coming into leaf, should be kept at 60° or 65°. Equalize by pinching

the shoots on different parts of the vine, especially on grapes in pots, retarding the upper shoots and encouraging the lower.

GRAPE CUTTINGS.—These should be kept rather cool at first, and the heat afterwards gradually increased. Keep the air moist above them; if too dry, so as to require watering, the superabundance of moisture below will rot them. Similar precautions are required in raising grapes from eyes.

Work for February.

Read carefully the directions for last month, many of which are applicable for the whole winter, and preclude the necessity of saying much here.

ROOT-GRAFTING the apple may be performed during the whole of this month. In order to do the work expeditiously, the tools and appliances should all be in perfect order, and everything placed so convenient that no unnecessary movement of the hand, consuming time, may be made. For full directions for performing the work, with illustrations, see page 315, Vol. II of RURAL AFFAIRS. The apple is nearly the only fruit that can be successfully root-grafted. Occasional success attends the root-grafting of the pear, but more commonly it results in total failure. In all grafting, it is desirable to select well-ripened, vigorous scions; the lower buds on the shoot are too nearly dormant to push readily, and the upper part is often too immature or spongy to succeed well. The middle portions of the scion are therefore always the best.


Fig. 6.

CATERPILLAR'S EGGS.—Pass through orchards and fruit-gardens with a basket on the left arm, and a knife or pruning-shears on a pole in the right hand, and clip off every shoot that contains a nest of caterpillar's eggs and carry them in the basket and burn them. Each nest contains several hundred eggs, (fig. 6,) and trees are now more easily and effectually cleared of them than after they have hatched and formed large webby nests. They encircle the young twigs near the extremities, and are thus easily detected by the practiced eye, and readily clipped off. A day should be selected for this work when the sky is rather dark, otherwise the eyes will be unpleasantly affected by the constant looking upward.

MANURING ORCHARDS.—Top-dressing orchards which are not growing with sufficient vigor, may be performed to advantage at any time during the month. Spread the manure evenly over the whole surface, and the thaws and rains of spring will carry the soluble parts into the soil.

Stakes for straightening up trees, labels for marking them, and ladders for gathering fruit, may be made on stormy days. For the mode of constructing different kinds of ladders, see pages 66 and 67, Vol. II of RURAL AFFAIRS.

Pruning.—All hardy trees may be pruned any time during the month, and those inclining to be tender, such as the peach, should be left a month later. All pruning intended to promote growth, should be done before the buds swell in spring. If done after the leaves expand, or while growth is in progress, the tendency is to check the tree, although the wounds heal more readily at this time.

Grape-Houses.—We cannot do better, under this head, than to copy the following brief directions from an experienced manager:

"Grape-vines in the houses, started in December, will now be out of bloom and swelling their fruit; commence thinning the bunches in good season, and be careful in doing this not to handle the berries, as they are very susceptible of injury at this season; maintain a good temperature and keep up a genial atmosphere by liberal damping af the floors in good weather. Vines in graperies and green-houses will now begin to swell their buds, and a good syringing, morning and night, will help to swell them up, and assist them in breaking stronger and more evenly; 50° to 55° is sufficient for a night temperature for the first fortnight. Vines in pots, brought into the house last month, will now be growing freely, and should be carefully watered."

Work for March.

Read the directions for the two previous months, and any work unfinished then may be now completed.

Heading-down Budded Trees should be done during the present month. All prominent buds on the stock should be rubbed off at the same time, as this will lessen the subsequent labor when the shoots begin to start, and prevent that check in the tree which is always given when any considerable amount of foliage is removed after growth has commenced.

Fig. 7.

Fig. 8.

Hardy Grapevines may be pruned if the work has not been already attended to. Grape eyes may be now started in the hot-bed. They are placed in pots about half an inch deep, as shown in the annexed cuts, (figs. 7 and 8.)

Grafting the Cherry, in order that full success may be attained, should be done at least a week or two before the buds begin to swell. If left much later, the operation becomes quite uncertain, and if the buds have already begun to expand it will be labor thrown away. Plums should be grafted immediately following, or nearly as early as the cherry. Finish cutting all grafts before the buds swell.

Cherry-stones, intended for raising stocks, should be planted as early as possible, as they commence sprouting in the ground where they have been

buried, the very moment the frost disappears from the soil. Apple and pear seeds should be left but little later.

ROOT-GRAFTING THE GRAPE is shown in the accompanying figure 9. A small portion of root is inserted in the graft, and the parts bound together with strips of waxed paper, leaving a portion open below for the emission of roots. A bottom heat under glass soon starts them, and they are transferred to pots, and afterwards to open ground.

Fig. 9.

An objection to this mode of propagation is that the grafts sometimes fail, and the roots grow, causing mixtures. The following excellent method is described by E. W. HERENDEEN, in the COUNTRY GENTLEMAN:—"Good, well-ripened wood, of large growth, is made up into lengths about two and a half inches long, having the bud at the upper end, about a quarter of an inch from the top, (fig. 10.) Pure clean building or lake sand is placed about three inches deep over the tanks in a forcing house, into which the pieces of grapewood are placed at an angle of about 45°, leaving the bud just at the surface of the sand. They are placed in rows about two inches apart, and about an inch apart in the rows, and the sand well pressed to the wood.

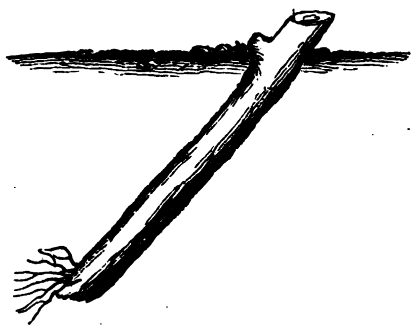


Fig. 10.

The sand should be warmed by the water in the tanks to the temperature of 65°, for a day or two, gradually raising it in a few days to 90° or 95°. The air in the house should be kept 10° lower, if possible, than the sand, at all times. Keep the sand moderately wet, and the temperature as even as possible, avoiding sudden changes. In about a week the buds will begin to swell, and in three or four weeks fine roots will break out in the bark, generally towards the lower end.

When the roots are three or four inches long they should be potted off in mold, made either by rotten sods or wood earth and sand, mixed in about equal proportions, and given plenty of water for some time, until well established in their new home, when they may either be left in the pots, or if the house is too full, turned into open ground.

The advantages of pure sand for striking the cuttings, seems to consist in

its being a good conductor of heat, and does not pack hard by wetting. Of course, the young roots grow from the organized matter in the cutting, the same as potato sprouts grow from a potato.

It is important to keep the air in the house colder than the sand, for the object is to stimulate the cutting at the root, and not by having a warm air and cold sand, stimulate the buds to throw leaves before the roots are formed, thereby causing the exhaustion of the cutting. For this reason it is best to start the cuttings in the house in the early part of April, while the air is cool, so the temperature of the house can be regulated.

It is very important to use none but good buds, as no process can give vitality to dead ones, or any success to imperfect ones—scarcely one in a hundred failing to grow when good buds were used."

Bearing Peach Trees may be now shortened back, according to the directions given in the article on pruning. Trees are often allowed to bear too many peaches, diminishing the size and quality, without increasing the number of bushels. Cutting back the shoots is an easy and excellent mode of thinning the crop; and the severity of the thinning may be varied with the amount of the wood thus removed.

Grape-Houses.—"Vines in the earliest houses," says a practical writer, "are now swelling up their fruit, and with the longer days and warmer sun will soon show a rapid improvement. Continue to top all laterals; thin out the bunches if the crop is too large; give liberal quantities of air in good weather and maintain a humid atmosphere. Vines in the green-house will now be breaking: syringe every morning until well out in leaf."

Work for April.

This month being the principal one for transplanting, comprises a large number of important operations. The land for setting out young trees should be prepared, if possible, in the very best condition—deep, mellow and properly drained. This should be particularly the case with small fruits and dwarf trees, which are planted near together, and the roots of which soon extend and fill the whole surface. Large orchards of the apple, &c., may be planted on well-prepared strips of land, and the intermediate spaces cultivated with other crops for a year or two. It is also of the utmost importance that a good selection of sorts should be made. Never buy trees because they are "cheap." The man who expects to purchase anything, without paying its full price, will commonly find himself mistaken, and there will always be some drawback. It will not be an economical expenditure to buy a hundred apple-trees at five dollars below the market price, and lose half of them because they have been badly grown, badly dug, and are poor, unsaleable sorts; nor more economical to get spurious or cheap sorts and lose fifty times their cost in subsequent years by raising small or unsaleable crops; therefore always procure trees from reliable establishments.

Full directions for transplanting are given on page 50, Vol. I of Rural Affairs. In cutting back young trees, when transplanted, remember that it is indispensable to do the cutting before the buds expand.

Transplanting Strawberries.—Early in the spring is the best season for setting out strawberries. If the work is done well they will bear a moderate crop the same season, and a heavy one the next. The best plants are the well-rooted runners from last autumn. They should be well taken up, so as to secure all the fibres, lifting the roots out with a spade and shaking the earth carefully from them; if pulled severely by the hand the roots will be torn off. The older and dead leaves should be cut off from the plants, and the roots trimmed to about two and a half inches long. For ordinary field culture they may be set out with a dibble, (fig. 11,) care having been previously taken to immerse the roots in mud to prevent drying. But for garden culture it is better to spread the roots out like the frame of an umbrella, (fig. 12,) and set them in a hole broad enough, with a small mound in the centre on which the spread roots rest, and form a cap, as shown in fig. 13.

Fig. 11.—*Strawberry plant, set out with a dibble, or in the common way.*

Fig. 12.—*Strawberry plant, set out by spreading the roots.*

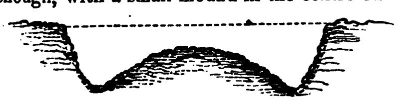


Fig. 13.—*Hole, for setting the spread roots of a strawberry plant.*

Half-hardy grapes and raspberries, laid down and covered late last autumn, should have the covering removed as early as possible, if not already done, and the stems placed in position. If this work is left too late, the moist earth in contact with the swelling buds, injures or rots them, and the owner is satisfied, therefore, that "covering does a great deal more harm than good."

Cuttings of currants, quinces, &c., taken off last autumn, and kept through winter, should be set out early, or as soon as the soil is mellow and dry enough. The earth should be trodden or packed against them from the bottom of the trench, compactly, all the way up, and about an inch left above the surface, which should be mulched with one inch of fine manure.

Root-grafted apples trees should be set out as soon as the ground is in proper condition, and the fruitful source of failure, viz:—a want of the close packing of the soil about them below, carefully avoided. Stock-grafting of apples and pears may be done in the North the first half of the month; and, if the grafts have been kept, without starting, in an ice-house or other

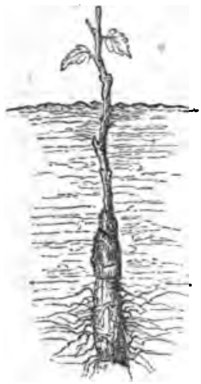


Fig. 14.—*Root graft, set out well, with earth compactly pressed against its roots.*

cool place, the work may be performed considerably later; but the earliest generally make the best growth the first season. Cherries should be grafted the latter part of the previous month, or not later than the first of the present, and plums not much later.

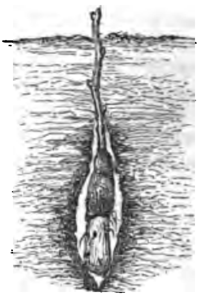


Fig. 15.—*Root graft, badly set out, or with a cavity below.*

The Seeds of Fruit Trees for raising stocks, should be planted as speedily as possible, or as soon as they give the first indications of sprouting. This is especially the case with cherry stones, which, if in good condition, will be found ready to grow the very moment the frozen soil has thawed in which they have been buried. If the different kinds of seed have been prevented from becoming dry, or have been kept moderately moist from the day that the pulp or flesh was removed from them, they will nearly always grow well the first year. • But some of them, and especially the cherry, if much dried, will not grow until the second year, if at all. It is most prudent and convenient, therefore, not to plant the seeds of trees until the moment they have commenced sprouting, for then we may be sure they will grow. In order that the young plants may easily find their way to the surface, they should be covered, or partly covered, with fine old manure, fine compost or leaf-mould, instead of strong, heavy soil which may become compact and crusted. Peach-stones may be planted last, as they do not start so soon as the others.

The small mounds that were thrown up late last autumn about the stems of young fruit-trees, to protect them from mice or to stiffen them against winds and shield the roots from cold, may now be levelled down. Autumn manuring and winter mulching should be turned in with the spade. Strawberries, which were covered with chopped straw or other litter, are to be uncovered by raking it off from the plants to the spaces between the rows.

All pruning should be performed before the buds begin to start, if the object is to promote growth or to give a proper form to trees. The only exceptions to this rule are the removal of an occasional distorted limb, rubbing off small shoots to give shape to the heads of trees, pinching in to promote fruitfulness, or lopping in summer to retard a rampant growth. See article on pruning in this number.

Young trees which were budded last summer should have the stocks cut back.

Orchards are sometimes seriously injured by not having sufficient drainage. Even old bearing trees have been much improved by laying tile two and a half or three feet below the surface, midway between the rows, (fig. 16.) The young forming roots being the most remote from the tree, receive the greatest benefit from drains thus placed, and the tile is less liable to be thrown out of position by large roots or filled by smaller ones. This work should be done towards the close of the month or later.

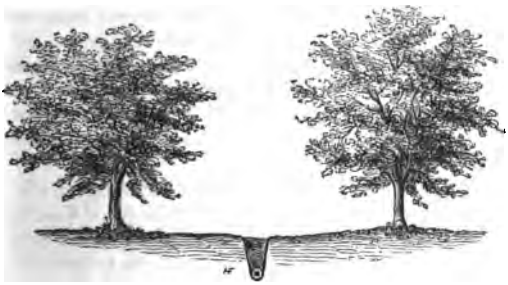


Fig. 16.—*Draining Orchards.*

The currant is one of the hardiest and most certain fruit-producing bushes, and for this reason is badly neglected. Good cultivation and pruning will more than triple the size of the fruit. Old bushes should have the old and stunted wood cut out, and thrifty shoots left at regular distances. Old manure should be spaded in about the roots, and the soil kept clean, cultivated and mellow. As the currant starts and expands its leaves very early, this work should be performed as soon as the frost leaves the soil.

Hardy grapes, if not already pruned, may still be cut freely—the "bleeding," as it is termed, having been found not to injure the vines.

Vines in cold graperies may be uncovered and placed in position. Grapevines in green-houses will have opened their leaves, and will have formed their bunches in flower; before the end of the month shoots will need pinching in. In forcing-houses the grapes will have already attained their size, and will begin to color before the month closes; maintain a uniform warmth and give air; continue to pinch the laterals.

Well arranged plans for fruit-gardens are given and described on page 271, Vol. I, and page 23, Vol. II of Rural Affairs.

Directions for packing trees for distant transportation are given in the last article of the same volume.

Work for May.

Fruit trees may be still set out with success, if they were dug early in spring, and, especially, if kept from growing, in a cool place. Early-dug trees, however, will do well under careful management, even if the young shoots have commenced growing. If the heads were shortened-in when they were taken up, they will be much the better for it. Serious injury is

sometimes done to young trees, which start slowly, by watering. The leaves not being yet expanded, the water evaporates from them very slowly, and hence to deluge the roots at this time may water-soak them and cause decay. A much better way is to water the stems only, or wet them two or three times a day until the leaves expand. For the only evaporation is from the bark, and, if the tree is wilted in any degree, it would be advisable to tie straw loosely around it, and keep this moist until the bark becomes plump and the buds begin to open. Trees which have been rejected as withered and dead, have been thus soon recovered, and have subsequently made a fine growth the same season.

The earth about fruit trees which were set out last autumn, has now become settled and compact, and it is absolutely essential for the successful growth of the tree that it be now made mellow and loose on the surface, and kept so during the summer. The common opinion that transplanting succeeds best in spring has arisen from the fact that the hard, untouched crust around autumn-set trees is more unfavorable to their growth than the mellower surface about those transplanted in spring.

STRAWBERRIES.—A. M. PURDY, of South Bend, Ind., a successful cultivator of the strawberry, gives the following practical directions for managing strawberry beds for the present month. If adopted, they must be carefully and fully carried out, and no portion omitted:

"We usually pass through our beds about this time with a fork, hoe or potato digger, and loosen the surface of the soil and pick out all weeds. It is then a good plan to scatter a *liberal* quantity of well rotted manure among the vines or 'hills." After which mulch well—say one inch deep, with sawdust or tan-bark, or clean straw or hay. If any of the readers of this article should have an old bed in which the vines have run together so as to become a thick mat of plants, spade under strips about one foot wide, leaving strips of plants about the same width. Work among these vines with a fork hoe—pick out all weeds and scatter a very liberal supply of well rotted manure among them, over which scatter the mulching.

"To those who think they will not get as much fruit in this way as by leaving the whole mass of plants, I would advise to try the experiment on one part of their beds, and report the result, especially in the size of their fruit.

"After the beds are through fruiting, spade over the ground, leaving narrow strips of plants—say three to four inches wide. Work well among these with the fork hoe—manure *highly*, and as the plants throw out "runners,' train them along the edges of the rows. Before fruiting season next year, give them the same treatment as before described."

WEEDS.—These will commence growing wherever they can obtain a foothold. They may be destroyed when only an inch high, with only one-tenth the labor required when they have reached a foot in height. Commence

early, therefore, and keep the surface perfectly clear of them, throughout the whole season. Among strawberry plants, currant and raspberry bushes, dwarf apples and pears and other trees set in gardens, the work must be done mainly by hand; but where they have been set out extensively for market, it is performed more effectually and economically by horse labor.

MULCHING may be commenced toward the end of the month, and is applicable to such trees as connot be worked by horse-power. It consists of a few inches of old straw, cut grass, long manure, tan or sawdust, spread several feet about the tree, and serves to keep the surface of the ground moist. It is especially useful to newly transplanted cherry trees, preventing their burning and withering at mid-summer, after they have started—a common cause of death to these trees. The mulching should be either thick enough to keep the weeds from growing through, or else it should be frequently removed, and the surface hoed mellow and clean. It should be spread broadly

Fig. 17.—*Badly mulched tree.*

Fig. 18.

or as far as the roots extend, and not placed in a narrow heap at the foot of the stem, as too commonly practiced, and as shown in fig. 17.

TREES IN THE NURSERY, which were budded last summer and headed down early in spring, should be kept rubbed clear of all shoots, except the one from the inserted bud. This work should be done before these shoots make much or any growth, as the removal of much foliage after it has formed always checks the tree. This remark applies with the greatest force to the cherry, next to the pear, afterwards to the apple, and least to the peach. As soon as the young shoot from the inserted bud grows a few inches, it should be tied up to the stump of the stock, (as shown in fig. 18,) which has been

left for this purpose, unless already quite straight and upright. Occasional crooked trees in nursery rows, if young and thrifty, may be made straight in a single season, if tied up to stakes before much of the new wood has formed. This treatment is useful for pear and other valuable trees, but does not "pay" for apple and peach trees.

Mulching is much better than watering, to keep the roots moist—watering in fact generally does more harm than good, by crusting the ground, and never gives a uniform supply of moisture.

Evergreens may be set out during the early part of the month, or at any time before much growth is made. The great secret of success in transplanting all evergreens is to remove a portion of earth on the roots. The Scotch Pine may be removed without much risk, and but little additional earth is needed, especially if the roots have been shortened by the spade in previous years, as they are straggling growers. Next to the Scotch Pine are the Balsam and Norway Spruce; but among the more difficult is the White Pine, one of the finest of all evergreens. But failure will scarcely ever occur if the rule is observed to take up a mass of earth on its roots large enough to sustain the tree stiffly in an upright position, when resting on the surface of the ground. All evergreens succeed best when taken from nursery rows where they have been subjected to open-air culture, instead of from dense forests.

Thinning the Fruit on overbearing trees may be commenced during the present month. On young dwarf pears it should not be omitted, otherwise the growth will be seriously checked. On older trees, and even in large orchards, it has been found of great consequence, by the improvement in the quality of the fruit which it has effected. In large peach orchards, thinning has been found to improve the crop so much in quality as to triple its price in market, while the increased size has maintained the full amount in bushels. The shortening-back of the shoots described in a previous month, is an excellent way of thinning the peach crop.

Vine Houses.—The earliest, or hot-houses, will gradually ripen their fruit. Keep the house dry and well aired, and employ fire in cool, moist weather. Vines in green-houses will begin to swell their fruit—these should be kept sufficiently warm, with plenty of moisture. The laterals should be pinched back as soon as they show indications of crowding.

Insects.—As warm weather advances these will increase and become numerous. Destroy them early before they commit serious damage, and before they multiply their numbers. Young caterpillars on orchards may be easily seen before the foliage has become dense, and are more easily destroyed when young. A swab of gas-tar will instantly kill every one it touches. Thin caustic lime-wash also answers a good purpose, and whale-oil soap is next best. Apply soft soap to the lower part of the trunks of apple trees, to exclude the eggs of the borer; and dig out or punch in their holes, all of

these insects which have obtained possession. Aphides, or plant-lice, which begin to cover young leaves, may be destroyed with a solution of whale-oil soap or with strong soap-suds. It may be thrown on with a coarse syringe, but is more effectual where the shoots can be bent over and dipped in the liquid. Towards the latter part of the month the curculio will commence his depredations. There are two modes of destroying it. The first is to destroy the larvæ in the young fruit as it falls, and is effected by sweeping it up daily and burning, or feeding it to pigs; or by turning in pigs and poultry to devour the young fruit. The second mode is killing the perfect insect—which is commonly effected by jarring the insects from the trees, on white, spread sheets, as described in former volumes of RURAL AFFAIRS. The combination of these two modes is the most effectual, and if applied unremittingly will save any crop. It is only in careless and occasional application that it results in failure.

In all the different modes recommended for destroying insects, it should be remembered that the only certain and reliable ones are those founded in actual *killing*. All attempts to repel, merely, by odors or other influences, are uncertain *at best*, and generally worthless.

Work for June.

Continue the operations recommended for last month, wherever they may be useful or necessary. The growth of weeds should be constantly prevented. Keep the soil perfectly clean and mellow wherever young trees grow. Mulch the surface well around newly transplanted cherry trees, to prevent the common disaster of their dying at midsummer. Mulch other young trees, where the ground cannot be cultivated to advantage; but remember that the best mulching, in most cases, is the coating of fine pulverized earth made by constant cultivation—especially where this can be accomplished by horse power.

Fig. 19. *Mode of staking up young trees.*

Continue to rub off the starting shoots on the stocks of fruit trees that were budded last summer or grafted this spring, and tie up the new shoots where they need it. It is not yet too late to stake young trees in the nursery row, to render them straight, (fig. 19.)

INSECTS, &c.—Continue the destruction of the curculio, as described last month—a common reason of failure is to discontinue this attention too soon, and before all the stragglers have have been killed. Watch for the borer at the foot of apple trees, and kill all that can be discovered, whether those that have already entered deeply into the wood, or such newly-hatched ones as are found only at the surface. Examine peach trees for the peach-grub; as these always remain in the bark they are easily followed with the point of a knife, and the grub will always be found at the extremity

of their burrow in the bark. Cut off the twigs from plum trees as soon as they show the first indication of the black knot. If this is promptly and unremittingly attended to, trees may be kept quite clear of them, and the operation proves unsuccessful only where it is neglected or left until too late. Aphides should be destroyed when they first appear, as directed last month. Straggling caterpillar nests that have escaped attention should be thoroughly destroyed. The gooseberry and currant worm, or slug, must be very closely watched at its first appearance; it may be killed by a daily application of well powdered, water-slaked, fresh or caustic lime—or better by dusting the leaves with white hellebore—the rain washing it all off before the fruit becomes fully ripe, and thus preventing any danger in using it. Fire blight in the pear is an uncertain and formidable disease—the best remedy is to cut the affected branches far back on its very first appearance, burning or burying the limbs—and to plant out two more trees for every one that dies of this disease.

Strawberry Beds will bear larger fruit and heavier crops if kept moist in dry weather. This may be effected by regular and moderate irrigation, or by copious watering each evening. Or, on a larger scale, nearly the same result is attained by mulching well between the rows with fine cut grass or soft straw chopped about two inches long.

Shaping the Heads of Young Trees.—It is now an excellent time to finish a permanent form to the heads of young trees, whether in the nursery row or in young orchards. If done in season, this work may be mainly effected by rubbing off unnecessary young shoots at their first starting, or at most, by cutting them out with a knife, so as to leave them equally distributed and without crossing, as directed in the article on pruning in this number. Thin out unnecessary shoots on young dwarf pears, and pinch off long shoots that are taking an undue lead of the rest. Strong growing grapevines should be well attended to; and unnecessary shoots which cause a dense mass of foliage should be taken out, so as to leave strong ones at even distances. Continue to thin fruit on young trees, where they are likely to overbear, removing all defective specimens and leaving the smoothest. Shorten back the new shoots on the blackberry, to give them a handsome form and to increase fruitfulness.

Grape-Houses.—Vines in green-houses will now swell their fruit rapidly, and require the completion of the thinning of the berries. Pinch back the laterals wherever they are becoming too long. Keep a mild and damp atmosphere, and use fire heat on cool nights or cold days. Vines in cold houses will bloom—give air freely and keep up the warmth by closing them early in the afternoon.

Work for July.

Continue the operations of cultivating the soil among fruit trees, so apt to be neglected at the present time— mulching where needed—thinning out fruit—rubbing off and pinching in shoots, to give shape to young trees—and thinning out supernumerary branches on grapevines, pinching back canes and bearing shoots that are becoming too long, and thinning the bunches and taking out imperfect berries. Do not pinch the bearing shoots too short, as they bear larger and better fruit when they have a full supply of well-developed leaves to feed them—it is an error to suppose that the sun must shine on the fruit in order to ripen it—the leaves alone perform this office, and quite as well if the fruit is shaded—hence the great point is to furnish the finest growth of leaves and give them plenty of air and light.

Those who wish to propagate a few vines of any particular sort of the grape, may do it most easily by layering. This is easily performed, and will succeed with scarcely a failure by bending down and burying with a few inches of moist soil, the middle portion of the present year's shoots, (fig. 20.) If the season is very dry, the ground must be mulched to keep the soil moist, and favor the emission of roots. These layers will be furnished with plenty of roots from the joints before winter, when they may be cut from the parent vine and taken up, each layer usually forming two plants.

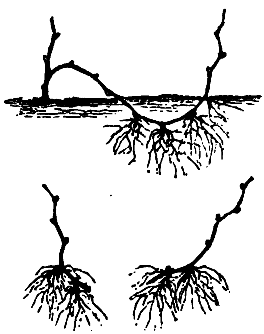


Fig. 20.—*Layering Grapes.*

Continue to pinch back the side and end shoots of blackberries, so as to keep them in a handsome, compact shape, as well as to increase their fruitfulness, and also to prevent the sprawling, straggling growth which is so annoying to those who gather the fruit.

Strawberry Beds.—Next to early spring planting, the season of partial rest to the plants which occurs immediately after bearing is the best time for transplanting. Take them up carefully, so as not to tear the fibres, cut off all the leaves except those just expanding, keep the roots moist by immersion in mud, and spread them out when setting them. Settle the ground about them by pouring on water, then complete the surface by a covering of fine, mellow earth; next apply a mulching, an inch and a half in thickness, of fine pulverized manure. All, or nearly all, will grow without any further watering; but should the weather become unusually dry, water may be applied without detriment, the mulch keeping the surface moist and preventing the formation of a crust. These plants will immediately grow,

become well established before winter, and, if well cared for, will bear a good crop next year.

Raspberries.—The old canes may be cut down as soon as the bearing season is over, which will allow new ones more room to become strong. Thin out the new ones, leaving three or four canes to each stool—unless more are desired for new plantations.

Watering Trees.—It very rarely happens that it becomes necessary to water young trees. If the soil has been kept mellow, it will have retained sufficient moisture; but if neglected, the indications of drouth will be small pale leaves and feeble growth. To impart vigor and restore a healthy deep green to the leaves, mellow the surface thoroughly and apply a mulching of several inches in thickness. In extreme cases, water may be given in addition in the following manner:—remove the earth from above the roots and then pour on tepid water copiously, and replace the soil and then the mulching. But watering, as commonly applied, does more harm than good. It is poured on the bare surface of the earth, and rarely descends far enough to reach the roots—and its only effect is to crust the surface and make it harder than before. Or if, by heavy applications, the water happens to descend to the roots, the earth quickly becomes dry again, and the alternations of wet and dry are of little use.

Budding.—This should be performed soonest on such stocks as first form terminal buds and cease growing; while such as continue to grow until autumn may be budded last. Among the first of these is the cherry; and as the buds adhere best as the cambium under the bark gradually thickens, the operation should, in general, be deferred until the terminal buds can be detected as just forming, when no further time should be lost. Plums and standard pears often cease growing soon after midsummer, especially on soils not well adapted to them; these should also be budded early. The Mahaleb, the French Quince for dwarfing pears, and the peach usually continue growing till after the close of summer, and consequently may be budded last. The buds of the peach, however, survive the winter best, when inserted early enough to cause a strong adhesion. Additional directions for budding, with illustrations, may be found on page 60, Vol. I of Rural Affairs.

Insects and Diseases.—Continue to watch for the peach-worm and apple-borer, and cut out black knots, and cut back fire-blighted branches, as directed last month.

Cherry Stones, for planting in nursery rows, should be secured when the fruit is fully ripe, by first washing off the pulp and mixing them at once with moist sand. If buried a few inches in the earth and covered with a flat stone, they will keep uniformly moist—better than in any other way. If they are to be sent long distances, they should be dried in the shade a few days to remove the outside moisture only, and to prevent moulding. If allowed to dry several weeks, they can scarcely ever be made to grow.

Grape-Houses.—Fruit which is now ripening should have a good supply of air, which will improve both the color and flavor of the fruit. Remove crowded shoots and secure a perfect ripening of the wood for next year. Thin the forming bunches in cold houses and remove defective or diseased berries. Guard against cold currents of air.

Work for August.

There is little additional work during this month that has not been already noticed in previous months. Continue the destruction of weeds; keep the ground mellow about young trees; pinch back shoots that are becoming too long in young trees and blackberry bushes; apply mulching to trees suffering from drouth; and transplant strawberries according to directions given last month, remembering that the sooner the work is done the more firmly will they become established for enduring winter and the better they will bear next season.

Continue to watch for insects, and especially for aphides or plant lice, which often increase rapidly during this month. Whale-oil soap, strong soap suds, or very strong tobacco water may be used for destroying them, according to directions already given. Keep a constant eye for black-knot on the plum, and fire-blight on the pear, cutting off instantly the affected parts. Excision will prove a reliable and perfect remedy in case of the former; and frequently, but not always so, for the latter. But it is better to cut away half or even the whole of a tree than to have it wholly destroyed by disease and to allow the malady to spread.

Budding may be continued. Finish up speedily on cherry, plum and standard pear, and commence early with apples. Mahalebs, peaches and quinces may be budded towards the close of the month. Watch the stocks in season and remove the ligatures as soon as they begin to cut into the bark.

Gather early pears as they approach maturity, but before they become ripe on the tree, and ripen them in drawers or boxes. This will much improve their quality and prevent rotting at the core, so common in summer pears. The proper degree of maturity may be judged in most cases by bending the stem—if the fruit is nearly ripe it will loosen its hold of the tree; but if it adheres firmly the pear has not sufficiently matured. There are, however, exceptions to this rule—the Bartlett, for instance, may be picked even before it has attained full size, and, in a week or two, will ripen into a fine, melting texture and excellent flavor. Ripening summer pears in the dark much improves their appearance. A Bartlett, for instance, fully exposed to the sun and allowed to ripen on the tree, or in a well-lighted apartment, will show perhaps only a light-brown cheek; but, if in a dark drawer, the light-brown will become a beautiful carmine or crimson. When

drawers are not at hand the maturing process may be accomplished on shelves, by first spreadidg a thick piece of woolen cloth, laying the pears on this, and covering them with the same. Pear-growers who send their crops to distant markets, should pack them early enough to reach their destination before the softening process has commenced. Large losses have sometimes occurred from bruising and other injury when sent later.

Work for September.

Complete the budding of peaches and quince stocks, and timely remove the ligatures. See the directions for last month in relation to gathering pears, and pick all valuable fruit carefully by hand.

See that newly set strawberry beds are kept entirely clear of weeds; and, unless intended for new beds, hoe off the runners.

The useless wood in young trees may be pruned out, and a good form given to the heads by any other pruning which may be necessary; as the summer growth being now about terminated, no check will be given to the tree.

Ground for setting out new fruit gardens should be prepared early in autumn, by the necessary plowing, pulverization and intermixture of compost or old manure. It will be in better condition for remaining a few months, and the manure will be more perfectly diffused through the soil than if prepared just before planting time. If the ground is intended strictly for a fruit garden, to be planted either with dwarfs or with small or moderate-sized trees, the roots of which in a few years will extend through every part, the whole surface should be thoroughly plowed, enriched and prepared. But for large apple orchards, where the whole ground will not be occupied for several years, the preparation of strips by plowing, eight or ten feet wide, will be sufficient for the present. Unless the land has a steep slope these strips should be plowed so as to extend directly down hill, and thus assist in effecting good drainage.

The amount of manure to be applied to orchard ground must be judged according to circumstances. In some places it is already rich enough; but, more frequently, a greater or less degree of artificial enriching is important. As a general rule, the leading shoots of young orchards should grow from two to three feet annually; if much less than two feet we may be sure that the soil and cultivation are not good enough; if the growth is more than three feet the wood will be too succulent and be liable to winter-killing. It should be remembered that heavy manuring, in orchards, should never be made a substitute for good, constant, clean cultivation—the latter tending to a more perfect and healthy ripening of the wood than can be effected on any land by manure alone.

Work for October.

TRANSPLANTING.—All young trees which have ceased growing may be transplanted any time during this month. The operation may be performed first with those which drop their leaves soonest; but any tree, by stripping its leaves, may be removed safely. If left on they will invariably cause the shrivelling of the trees in consequence of the large amount of moisture they are always throwing off, and which cannot be restored through the roots while they are out of the ground. Autumn transplanting possesses some advantages—such as the greater length of time allowed for performing the work well—the good condition of the soil, being usually dry enough and easily managed—the opportunity of making the first selection in nurseries—and the more perfect settling of the earth among the roots, through winter—giving the trees an earlier chance to start. The disadvantages are—trees being always rendered tenderer by removal, those which are not perfectly hardy are liable to be injured by the cold of winter—or by sharp cutting winds—or by the stems being blown about and the roots loosened in the soil. These difficulties may be obviated by planting the trees in naturally dry soil, sheltering them from winds, or planting them in sheltered places, and by staking firmly, or by making small, compact embankments about the stems, (fig. 21.) Another disadvantage from the compact settling of the earth about fall-planted trees is the hard crust of soil which encircles them the following season, retarding their growth. This difficulty is very easily obviated by keeping the ground mellow, as it always should be—a practice never omitted, except by slovenly managers. For more complete directions for transplanting, read "Work for April."

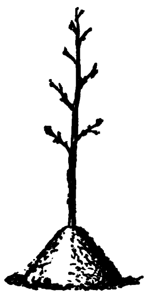


Fig. 21.—*Mode of banking against newly set trees.*

GATHERING FRUIT.—Autumn pears which are approaching maturity should be gathered by very careful hand picking. Winter varieties should be left on the tree as long as they can remain without danger of freezing. Unlike summer and autumn pears, a great improvement in the flavor will be found to result from hanging late. This is particularly the case with such sorts, the Winkfield for instance, as require some care to ripen into good quality. Winter pears are found to keep best when placed in a cool cellar. It should be dry enough to prevent moulding and decay, on the one hand; and to have moisture to prevent shrivelling, on the other. Half-barrels have been found convenient for packing and keeping winter pears, and for sending them to market. The former practice of placing them, for a few days, in a warm room with nearly summer heat to finish the ripening process, has not been found so favorable to preserving their best quality as when they are allowed to ripen the natural way in the cellar.

For a convenient mode of hand-picking winter apples, see the directions

for this month in last year's REGISTER. Those who wish to derive a handsome profit from the sale of winter apples, should not only see that the trees are kept in good condition by proper cultivation, and thinning the fruit on the tree when it overbears, but also by carefully picking, assorting and packing in the best manner. A reputation for furnishing fruit of only the best quality, will ultimately be worth hundreds of dollars to every considerable orchardist. He should, therefore, seduously endeavor to maintain a high reputation for character with the city dealer to whom he consigns his fruit and with the purchasers who consume it. After obtaining such a reputation, his brand, which he should place on every barrel, will not only bring him in higher prices, but will enable him to sell readily all his good apples in those abundant seasons when the market is apt to be overstocked. Poor specimens should never be sent to market, but should be carefully picked out beforehand, and used either for culinary purposes or stored for feeding domestic animals. It will generally be found that the crop of an orchard will sell for more money, after the imperfect or knotty apples are all picked from it, than the whole would bring without assorting.

GATHERING AND KEEPING GRAPES.—The great leading requisite for keeping grapes successfully in winter, is to have them *well ripened*. When grown on crowded, unpruned, uncultivated vines, they will be small, acid, watery, and will quickly shrivel in a dry atmosphere, and mould and decay in a moist one; and they will quickly freeze if the temperature of the air goes much below the freezing point. But well grown and well-ripened fruit, (resulting from good cultivation and judicious pruning,) contains a rich juice which prevents them from shrivelling, decaying or freezing, even at a quite low temperature. Such only, therefore, should ever be chosen for winter keeping. Various modes are recommended for packing away grapes for winter. They all succeed well, if good, well-ripened grapes are taken, as already mentioned, and are placed in a cool and rather dry apartment where they will not freeze. They may be placed on shelves, packed away in small boxes, or placed in larger boxes containing a bushel each, and separating each layer by cotton batting, soft paper or dried maple leaves. They should, of course, be entirely free from moisture when packed away. As a general rule they are not ripe enough unless the stem which holds them has lost its naturally green color and has assumed something of the color of the grapes,—which will be somewhat purple in all dark-colored varieties. One of the best of all keepers among American sorts is the Diana. The Clinton also is an excellent keeper. The Isabella, Catawba and Rebecca keep well.

MANURE may be applied to the surface about young trees where it is desired to accelerate their growth another season. It may lie upon the surface till next spring.

GRAPEVINES in green-houses should have their growing shoots pinched in;

and vines in cold houses, as soon as the fruit is picked, should be thrown open and exposed to the air to finish the ripening of the wood.

Work for November.

FRUIT TREES may be transplanted any time during the present month, when the weather is mild and not freezing. Carefully register in a book the names of every sort in the orchard—this register may be referred to when the trees bear in future years, and the names of the different sorts ascertained, where time has destroyed the labels. If there is danger of young trees being loosened by the wind, stake them or secure them by embanking compactly the earth about them for a foot or two, as figured in last month. This will also protect them from the effects of hard freezing at the roots. Where danger is apprehended from mice, throw up a smooth mound of compact earth around the stems of trees—this will serve as a perfect protection. This precaution is especially necessary for such trees as were mulched last summer or the present autumn for remaining through winter. Such mulching is a good protection in severe climates, but can be safely adopted only where the above precaution is used, as it affords an ambuscade for the mice.

Trees received from a distance may be safely kept through winter by the process of heeling-in described in last year's REGISTER, for this month. If they should accidentally arrive late and in a frozen condition, bury them immediately in mellow earth and the frost will be gradually abstracted from them without injury. If the roots are frozen out of the ground or in contact with the air, they will be ruined beyond recovery.

HALF-HARDY RASPBERRIES may be protected for winter by bending them down and covering them with an inch or two of earth, tan or sawdust, (fig. 22.) A small mass of earth should be placed against the foot of the stems, over which they may be bent without breaking. Two stools may be bent towards each other, and covered at one operation. A similar covering answers for half-hardy grapes—the wood having been well hardened or ripened, the moist earth will not cause the rotting which occurs with immature buds and wood.

Fig. 22.—*Bending down Raspberries for covering.*

COVERING NEW ROCHELLE BLACKBERRIES.—These are often killed in cold regions. The following mode of covering is described in the COUNTRY GENTLEMAN, by AMOS FISH, of Bethlehem, N. Y.:

"At the approach of winter remove the stakes and lay the bushes at right angles from the rows, flat on the ground, and cover them two or three inches

deep with earth, as follows:—Cut off the limbs within one and a half inches of the canes, at the right and left hand sides of the row, making flat bushes. 'Shorten-in' the remaining limbs by cutting off the slender ends; then, with a digging or dung fork, loosen the earth about the roots, and remove some, laying the roots loose on *one side*, so that in laying down the roots shall be bent instead of the canes being broken. When laid down use bricks to hold them down while covering, and remove the bricks when in the way. The bushes should be raised up and the stakes replaced as early in the spring as the frost is out of the ground, which can be easily done with a fork if the rows are laid down singly instead of lapping over one another."

In Nurseries, plow between the rows, turning the furrows toward the trees. Stocks for root-grafting should be taken up and packed in boxes in cellars for winter use. If washed clean and packed in fine, damp moss they will keep well; come out fresh, and not dull the grafting-knife by any grit upon the roots. Scions for spring-grafting of any half-hardy sorts, such as the tenderer varieties of the pear and plum, should be cut before cold weather and packed as just directed for seedlings. All grafts used by nurserymen should be cut late in fall or early in winter, and properly secured in the same way. To avoid mistakes, cut carefully from bearing or proved trees, and let every bundle or package be distinctly marked on at least two labels. Cuttings of French quinces, currants, gooseberries, &c., should be made, and either planted now as directed last spring, protecting with a good winter-mulching; or else packed away in boxes with interposed layers of moss, as already directed for seedlings.

Grape Layers, made during the early part of the summer, may be now separated from the vine, taken up, pruned and packed away in moss or heeled in the earth for spring planting.

Work for December.

Examine the directions for last month, and promptly complete all jobs not finished in season. Finish the cutting of grafts—apply winter mulching to young trees—top-dress with manure the ground about such trees as need enriching. Collect stakes, sticks, tallies, labels, &c., which are out of use, and tie up and pack them away. Examine the directions for January, and perform any operations which may be required.

Grape Houses.—In early houses the vines pruned last month will begin to swell their buds. Apply during the present month a regular and moderate temperature. Prune vines in green houses and cold houses, and protect the latter by a covering of leaves.

PRINCIPLES AND PRACTICE OF PRUNING.

A great deal has been said and written on this subsect, and a great deal of bad practice still prevails. Orchards are seen all through the country which have either been never pruned, or, if the work has been performed, it has done more harm than good. Trees with trunks trimmed up to three times the proper height, mutilated by the needless lopping of large branches, one-sided and totally destitute of symmetry, or filled with a mass of brush, may be seen all through the country. A perfect orchard is a rarity. The same remark will apply to nurseries. The trees have been grown and trained with very little attention to a perfect shape, the chief object of the owner being to raise large trees in as little time as possible. The purchasers of such trees, after setting them out, either give little attention of any kind, or, if they cultivate them well, allow them to form their own heads as best they can. They may be too tall or one-sided or distorted and irregular, but no attention is given to shaping the heads when they are young and easily and permanently formed. Some of the European nurserymen are more particular, and imported trees, and especially imported currants and gooseberry bushes, indicate the care taken to give a fine shape to the future tree.

Pruning Young Trees at Transplanting.—When young trees are dug from the ground, the roots from necessity are more or less bruised or mutilated. All these bruised or torn surfaces should be pared off smoothly with a sharp knife. If left untouched they induce decay, and are unfavorable to the best healthy growth of the tree—in the same way that a broken or bruised limb above ground would furnish a dead stub or make a bad scar, while pruning it smoothly will cause it to heal over readily. In pruning the ends of the roots draw the knife upwards, leaving the sloping surface on the under side, which will induce the young roots thrown out from the edges of the cut to strike downward in a natural position.

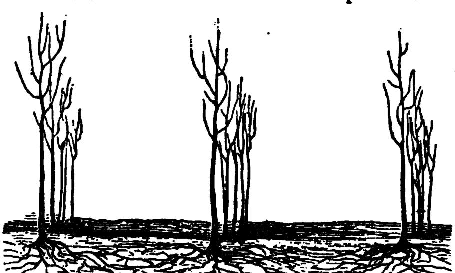


Fig. 1.—*Nursery rows—roots extending under the whole surface.*

Pruning the Tops.—Thrifty young trees usually have roots extending as far each way from the foot of the stem as the height of the tree. A careful examination will discover the whole surface of the subsoil occupied with the small fibres of full-grown nursery trees, (fig. 1.) It is obviously impossi-

ble, therefore, in digging up to avoid cutting and leaving most of the roots behind; and the tree when reset is unable to sustain or feed for a time all its leaves and branches. A part must therefore be cut off to restore the balance, corresponding in some degree with the loss of the roots. This may be done by thinning out all the feeble shoots, so as to leave an even, well-shaped head, and then cutting back a part of each remaining one-year shoot, (fig. 2.) Judgment must be exercised as to the amount thus cut away from the tops. The growth of new roots depends on the assistance afforded by the leaves at the top; if the leaves are too few, the roots will not extend freely; if they are too many, the roots cannot furnish proper supply for them, and they will be feeble and sickly. Planters will learn a great deal on this point by cutting away more or less on different trees, and observing the result. Different kinds of trees require varying management in this respect,—the peach, for example, readily reproduces new shoots, and it may, consequently, be cut back very freely; two-thirds to nine-tenths of each previous season's shoot may be removed without detriment. This peculiarity of the peach allows the removal of larger and older trees than otherwise—such as are three or four years of age, if heavily pruned, bear transplanting well. The grape, also, may be very heavily pruned, as it throws out new vines with great vigor. The cherry, on the contrary, is very sensitive, and young trees have been nearly killed by a severe summer pruning. The young cherry shoots should never be cut back in spring more than half their length. The pear and apple are intermediate, and their heads should be moderately and not very severely pruned.

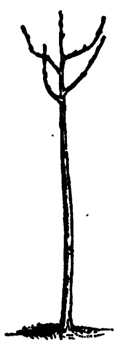


Fig. 2—*Figure of thinned and shortened-back young tree.*

The mutual relation between the roots and leaves has been already alluded to. The leaves cannot exist without the moisture received through the roots; and the roots cannot grow without the nourishment afforded by the leaves. The only exception is the temporary supply furnished by the cells in the body of the tree. New roots are commenced before the leaves expand, as may be seen on young seedlings, or other young trees, the roots of which have been trimmed, and where the white young fibres protrude just as the buds are swelling. The same occurs on the roots of trees transplanted in autumn, after the leaves have fallen; but this effect is only temporary, continued growth requiring that both leaves and roots should work together. On the other hand, the nutriment laid up in the cells will sometimes supply the leaves for a short period, provided care is taken to furnish the requisite moisture at their surfaces by means of a bell-glass, to retain a damp atmosphere. Cuttings are often thus started, a small portion of leaves being allowed to remain upon them to assist in the emission of new roots. But, if the leaves are placed in a dry air, they soon pump out and

carry off the moisture, and the shoot, leaves and all, within a short time. If all the leaves had been cut off, the shoot would remain plump much longer—a fact well known to nurserymen and and others who preserve scions for budding plump by the prompt removal of the leaves.

PROPER TIME FOR PRUNING.—Many cultivators have been misled into the opinion that early summer is the best time to prune, from the fact that the wounds heal more readily. Pruning after the tree has commenced growth has a tendency in nearly every instance to check the vigor of the tree. For this reason, where the rapid formation of young wood is desired, the work must be performed before the buds begin to swell. Some planters have objected to shortening-in the shoots of newly-set trees, because by doing the work too late, or after the leaves were partially or wholly expanded, they have injured and not benefitted them. Any one may easily satisfy himself on this point by pruning back the heads of a dozen trees early in the season, and leaving those of another dozen until the leaves have opened. They will present the appearance represented in the annexed figures, before the close of summer—the first, (fig. 3,) with strong, thrifty shoots; the latter, (fig. 4,) with short, stunted growth.

Fig. 3.—*Head of young tree pruned before the leaves had expanded.*

Fig. 4.—*Head of young tree pruned after the leaves had expanded.*

There may be an exception to this general rule, where a slight amount of pruning in summer, not sufficient to produce any material check in growth, may be useful in improving the shape of the tree; such, for example, as the removal of an occasional, unnecessary shoot or one-sided branch.

As fresh wounds always render trees more liable to be affected by intense cold, quite hardy trees only may be pruned any time during winter. On those inclining to be tender the operation should be deferred till towards spring.

PRUNING, AS AFFECTING FRUITFULNESS.—As a general rule, the rapid formation of leaves and wood is adverse to the production of much fruit. On the other hand, the slow growth of the wood favors the formation of fruit-buds and the production of heavy crops. These two adverse tendencies may be more or less controlled by pruning.

When the too numerous branches of a tree produce more leaves than can

be properly supplied with nourishment, resulting in a feeble or diminished growth, new vigor may be often imparted by judicious pruning, directing the sap into a smaller number of channels, and thus increasing its force; for example—peach trees, after bearing some years and yielding smaller fruit than on fresh young trees, will assume all their former thriftiness by partly cutting back, and thinning out the heads. Dwarf pear trees, which have not been sufficiently manured and cultivated, whose pruning has beeen neglected, and heavy bearing allowed for a number of years, have been restored by severely pruning back the branches and thinning out the fruit spurs. In all such operations as these, it is indispensable to observe the rule already given to do the cutting-back in winter or early in spring, before the buds have swollen. If trees are too thrifty and do not bear, a check may be given, and many of the leaf-buds thus changed to fruit-buds by a continued pinching-back during summer.

Giving Desired Form to Trees by Pruning.—A tree may be moulded into almost any desired form by a proper use of the knife, or even by the rubbing and pinching process. If a young tree from the nursery is too tall and slender, or has too high a top, it should not be altered much the first year after removal, but allowed to become toberably established with its new set of roots. The second year it may be cut back freely, (figs. 5 and 6,) taking care to leave buds for the formation of an evenly distributed head. Some kinds of trees will bear cutting back freely the same year they are removed, as, for example, the peach, which, as already observed, readily produces new shoots. The same characteristic is possessed by the sugar-maple and some other trees, which, as many have observed, when planted along the borders of streets, and cut back to-single poles, form heads at once of new braaches.

Fig. 5.—*Mode of reducing the height of a tall young tree by cutting at the dotted line.*

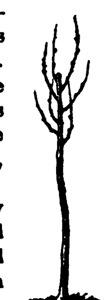


Fig. 6.—*The same, after the operation is completed.*

When the tops are too low (which is rarely the case,) the lower branches may be pruned off and the top carried up to any desired height. This should not be done until the stem has thickened sufficiently to sustain the top—the side-shoots always tending to increase the diameter of the stem which bears them. If the young tree possesses great luxuriance it may be desirable to throw more of the growth upward than these side shoots would allow, if remaining till the following spring, the usual time for pruning. In such a case the ends of the side limbs may be clipped or pinched off, and a portion of the lower ones removed with the knife.

Pruning Nursery and Young Trees.—Brief suggestions have been already furnished on this subject in connection with the explanation of general principles. Directions of a more minute and practical character, and applicable to the different kinds of trees, will doubtless be useful and acceptable. It is of great importance that a tree be pruned right, on the start; for the misplaced shoot, which might be easily rubbed off with the finger, when just beginning to grow, may ultimately become the heavy limb and the misshapen top.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Pruning Single Shoots.—Young shoots are cut back for various purposes, such as cutting down to an inserted bud, shortening-in those that are too long, or cutting out supernumeraries. It is important that even these simple operations be rightly performed. 1. The cut should always be made with a sharp knife, which does the work smoother, better and more completely at the control of the operator. 2. The cut surface should be as small as practicable, in order that it may heal over readily. The two annexed figures show the right and the wrong way of doing this work, fig. 7 being a well-made cut, and fig. 8 being one performed by a careless workman, exposing a large cut surface and leaving an inconvenient and sharp stub above the bud intended to grow. 3. The cut should not be made too far above the bud, nor too near it. If too far above, (fig. 9,) in the space between the buds or joints, this portion, not being fed by leaves, dies, and the wood must be afterwards pruned again in order to make a smooth stem. If the cut is made too near the bud, as in fig. 10, the drying surface abstracts moisture and enfeebles the bud, which either fails to grow or grows feebly. Trees that are soft and porous, as the peach and grape, should have more wood left above the bud, to prevent drying; and in pruning down to all inserted buds, it is generally safest to leave an inch or two until the young shoot has fairly commenced growing, when the

Fig. 11.

Fig. 12.

Fig. 11—Pruning down to inserted bud—the dotted line a, *shows the proper place to make the cut—*b *is too near the bud.*
Fig. 12—The bud after starting and tying up.

stump may be pared down close to it by a single draw-cut of a sharp knife, made side-wise, so that the point of the knife may not strike the shoot, (figs. 11 and 12, p. 169. 4. In shaping the heads of young trees, prune down to an *inside* bud, where an upright shoot is required; but prune down to an *outside* bud where a more horizontal or spreading growth is sought, as, for instance, in such vertical growers as the Northern Spy and Early Strawberry apple trees.

PRUNING YOUNG APPLE TREES.—Directions have been already given in relation to forming a high or low top. In consequence of the crowded growth of nursery-trees, they are apt to push upward to reach the light, at the expense of the side-branches. In addition to this influence, being closely trimmed on the sides to make them tall, such mismanaged trees assume the appearance of the annexed cut, (fig. 13,) and have been compared to a low-bowing French dancing-master. A better-shaped tree is shown in fig. 14. As all nursery trees succeed better, are more sure to live, and are more vigorous and make handsomer trees when set out quite young, or at not more than two years from the bud or graft, the following directions apply to such trees at the time of planting and immediately afterwards. Three or four side-shoots on the unformed tree, (figs. 15 and 16, p. 171,) should be at first selected, to form the main branches and to constitute the foundation or frame-work of the future top, (see fig. 2 of this article.) In order to secure a well formed and nicely balanced head, these shoots must be frequently watched through the first summer of growth, and if any of them are disposed to take the lead of the others they should be pinched and checked to maintain an equality. Two buds will be enough to grow on each of these shoots, making eight at the end of the season, taking care that all are distributed at equal distances, (fig. 17, p. 171.) All the other shoots should be rubbed off with the thumb and finger as soon as they form. The second year the same process is repeated on the new shoots, and continued until a handsome, even, symmetrical frame-work for the future head is obtained, after which comparatively little attention will be necessary. A large orchard

Fig. 13.—*Nursery tree pruned too high.*

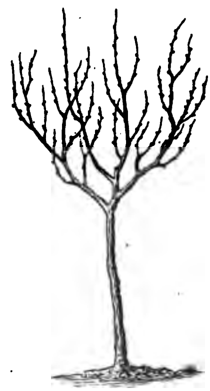


Fig. 14.—*Well formed young tree.*

of young trees may be managed in this way with a very few days' labor—far less than that afterwards required in cutting out large limbs and giving shape to the distorted tops of full-grown, neglected orchards. These rules will apply, substantially, to the pruning of standard pears, except that they generally require less thinning out.

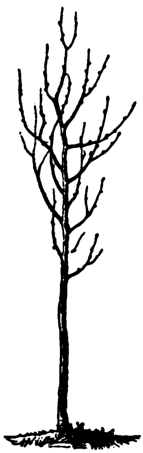


Fig. 15.—*Unformed tree.*

Nearly the same course is to be pursued in forming the heads of dwarf apple trees, with the exception that the base of the head should be only about ten inches from the ground, (fig. 18;) or if they be half-standards on Doucain stock, the heads should be about twenty inches or two feet high.

Fig. 16.—*Unformed tree, left unpruned till older.*

Full directions for pruning the dwarf pear may be found on page 56 of Rural Affairs, Vol. I, and on page 43, Vol. III of the same work.

Pruning the Peach.—No tree requires continued pruning so much as the peach. There is a strong tendency in the terminal buds to push upward and outward, at the expense of the side-shoots, which soon dying, the tree ultimately is composed of long, bare poles with only tufts of leaves at their extremities, (fig. 19, p. 172.) It is well known that young trees bear large, handsome and excellent fruit, while the old, enfeebled trees yield nothing but small specimens of inferior quality. Continued pruning will prevent this bad result, and preserve

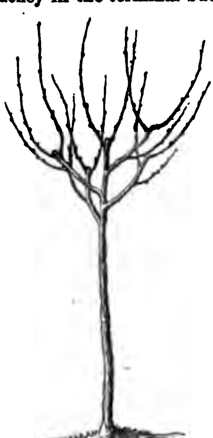
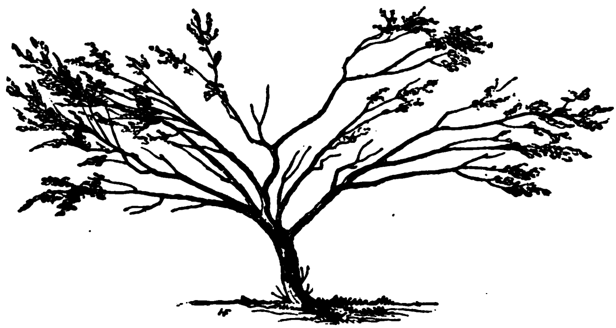


Fig. 17.—*Well formed head.*

Fig. 18.—*Dwarf Apple.*



No. 19.—*Neglected Peach Tree.*

the heads of old trees in a state of thrifty growth, and they will continue to yield as large and fine fruit as on the first years of bearing. As the peach always bears its fruit on the previous year's growth, and buds never start from old wood, it is important to keep a continued supply of young wood, evenly distributed throughout the head. This can only be done by continued cutting back. The best way to perform this operation is to commence at the close of winter or early in spring, and cut off the upper half or two-thirds of every one-year shoot. If this process is continued from year to year, in connection with cutting entirely out all the feeble shoots where they grow too thickly, the desired object will be fully attained, and the trees, as they grow older, instead of presenting the appearance of fig. 19, will form the round, symmetrical, evenly distributed heads shown in fig. 20. An important advantage of thus pruning the peach will be the thinning out of the fruit-buds; and while the tree will bear perhaps only one-third or one-quarter the number of specimens, they will be so much larger as to give as many bushels, while the quality will be incomparably superior.

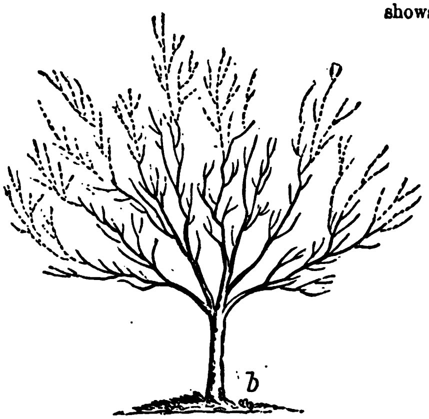
Fig. 20.

An objection is made that too much labor is required for this operation. By the use of a good pair of pruning-shears, however, it may be done with great expedition, and a half a dozen trees finished in the same time that would be required for a single tree in using the knife.

Another mode, more rapidly performed, and answering nearly the same purpose, is to cut off two or three years' growth at a time, from all the longer branches, taking care to leave a sufficiency of young wood, and always cut-

a

Fig. 21.



b

Fig. 22.

ting back to a fork, so as not to make a dead stub.

In cases where the pruning has been neglected on young trees, until they have attained several years of age, and the shoots have just begun to die out in the centre, a still more wholesale kind of pruning may be adopted. Three or four feet may be taken off, in cases of necessity, at a single stroke, and if judiciously performed, will convert the broad head which is beginning to become enfeebled, into a smaller, neat, round and open head, possessing all the thriftness of a young tree, and bearing as large and excellent fruit. Fig. 21 shows the tree before being thus cut back, and fig. 22 the same, with all the ends of the branches, shown by dotted lines, removed. It must be remembered here, as in all other instances, that the outer shoots must be sufficiently *thinned-back* to admit light to the interior. The shearing, which is sometimes adopted, like that of a common hedge, only thickens the foliage on the outside, and increases instead of diminishing the evil.

Pruning the Cherry.—The cherry, usually, needs but little pruning, after the young tree has been properly formed. As wounds made in winter are apt to form gum, and the the removal of much foliage in summer injures the tree by checking its growth, the rubbing and pinching process should be exclusively resorted to, in forming an even and well-distributed head, nearly after the same manner

as already described for the apple. The only care, as the trees become older, is to see that no shoots, by outgrowing the others, form a distorted top.

Nearly the same rules apply to the plum; but as single shoots sometimes make a long growth in a single season, an eye must be kept to them, and the necessary rubbing and pinching performed, that they do not outgrow the others.

Pruning the Quince.—Brief directions are given on page 290, Vol. III of Rural Affairs. In addition to these hints, we may here remark that young quince trees, as sold by nurserymen in this country, have, in most instances, received no pruning or training, and resemble fig. 23. To give them a single straight stem and to impart sufficient vigor to form a good well-balanced head, such trees should be cut down near the ground as soon as they become well established, and a single upright shoot allowed to grow for the future tree, (fig. 24.) The second year a good head may be commenced, according to the directions given for the dwarf apple.

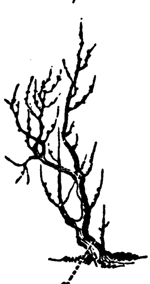


Fig. 23.—*Unpruned Quince.*

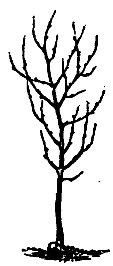


Fig. 24.—*The same, cut back and new stem formed.*

Pruning the Raspberry and Blackberry.—Full directions for the raspberry, with illustrations, are given on page 285, Vol. I of Rural Affairs.

Pruning the blackberry is commonly but little understood. We hear frequent complaints of the rambling and straggling growth of this bush, &c., extending across alleys, tearing dresses, at the same time proving unproductive. This is all owing to a neglect of summer pruning. As soon as the new shoots have reached three and a half feet in height, the ends should be pinched off with the thumb and finger, which will cause the protrusion of laterals. These in turn are to be pinched off when they have grown eighteen inches. It will be necessary to pass along the rows every two weeks in doing this work, as new shoots will be constantly thrown out during the entire summer. The plants being thus kept within bounds, will present the neat, compact and productive bushes shown in fig. 25, instead of the unproductive stragglers, if left untouched, represented by fig. 26.

Fig. 25.

Fig. 26.

PRUNING THE GOOSEBERRY AND CURRANT.—In the culture of the gooseberry and currant three distinct modes are adopted. The first, which is quite common in this country, is to plant the bushes along garden fences, where they often grow up with grass, and, being neither cultivated nor cared for, the fruit becomes small and of little value. This is the worst mode.

The next is to cultivate, but not prune them. The fruit on such bushes is fine while they are young, but as they become filled with a profusion of old bearing wood it becomes diminished in size.

The third and best mode is to give them good, clean cultivation and to keep up a constant supply of young bearing wood, yielding large and excellent crops.

The currant and gooseberry, like the cherry, bear their fruit on shoots two or more years old; and it is important that a succession of strong young shoots be maintained for this purpose. The branches of the heads should therefore be distributed at equal distances, and the old bearing spurs cut out when they become too thick or enfeebled, and new shoots allowed successively to take their place.

When the young gooseberry or currant bush is set out, all the buds or suckers below the surface of the ground should be previously cut off clean, so as to form a clear srem. It is often recommended that this stem be a foot high before branching,—which does well for the moist climate of England; but under our hot suns it is better that the branches begin near the surface of the ground.

Old currant bushes, such as have grown up to a thick mass, may be greatly improved, and will increase the fruit several times the size, by thinning out clean all the old crooked wood, and leaving a sufficient number of young stems at equal distances, to bear the future crop.

The English gooseberry, in this country, will remain free from mildew only so long as it is kept in a vigorous growing condition by frequent and judicious pruning, so as to give a constant succession of strong shoots.

PRUNING OLD TREES.—As already shown, trees well managed when they are young need very little pruning after they become old. But there are many orchards which have been neglected; and these may be much improved by judicious management. In the first place, it will be best to say how they ought *not* to be pruned. The accompanying figures represent specimens of badly mutilated trees, spoiled by a process called trimming—and done with the axe or saw, as was found most convenient. This mode has formerly been very common throughout the country; and the leading principle of the operation, so far as there is any principle connected with it, was to cut off all the limbs within the reach of the operator, and which should have been left to form a round, handsome head,—and leaving the tallest or most remote portions which were beyond his reach, and which perhaps should have been shortened-in or brought down. Fig. 27, (p. 176,) is termed a

Fig. 27. Fig. 28.
Sprawling and two-story trees.

sprawler; fig. 28, a two-story tree; and fig. 29, a three-story one. This ruinous mode of pruning has been frequently adopted in re-grafting large trees, the grafts being set far enough up towards the clouds to secure small limbs for their insertion; a better mode is to graft the uppermost and central portion the first year, after having been properly cut back; the middle, the second year; and the lower and exterior part of the top, the third year. If there are not enough small branches for the insertion of the grafts, cut back in winter or early in spring, and new shoots will be emitted, which may be easily budded or grafted. In cutting back, avoid, if possible, the removal of very large limbs, that the wounds may not be too long in healing over. To prevent the parts from decaying, apply to the cut surface, after it has dried a few days, a coating of thick ochre paint, a thick solution of shellac in alcohol, or a warm mixture of fine sand or brick-dust with gas-tar. These wounds heal much more readily if the pruning is done after the tree is in leaf; but, as has been already explained, trimming at this season seriously checks the growth. It should be resorted to, therefore, only where the trees are in a thrifty condition, and where but a moderate amount of pruning is required—and never, in any case, for the formation of a new top in old trees.

Fig. 29.—*Orchard tree badly pruned and made into a three-story tree.*

Root Pruning.—This is sometimes done to check the growth of trees and produce fruitfulness—in the same way, but in less degree, that transplanting produces a like result. It should usually be done early in spring, and with

spade ground sharp and kept solely for this purpose, so that the roots may be cut off smoothly, and not torn or bruised, as with a dull spade. Any required degree of check may given to the tree by cutting the roots short or near the foot of the stem—a less check by allowing greater length.

Pruning the Grape.—The previous volumes of Rural Affairs have furnished articles on pruning and training the grape, as on pages 194 and 280 of Vol. I, page 313 of Vol. II, and pages 120 and 212 of Vol. III.

Strong-growing American sorts require more room than cultivators generally have given them, although the limited space has succeeded well for a few years while the vine is young. The dwarfing system of Bright, which attempted to keep the vines within a very narrow space, has proved a failure, after a few years growth of the vines. The Cincinnati vineyards, where the Catawba is trained to single stakes and allowed a space of only four feet, do not furnish such large bunches, nor such heavy products, as where the vines in the same neighborhood are allowed to extend more freely on a trellis. The remark has been often made that where the Isabella is allowed to ramble extensively on trees, it yields better fruit than if cramped on a small artificial structure, without being properly cultivated and pruned. As an appendix to the articles already alluded to, the following description of the management of Dr. Underhill and his brother, W. A. Underhill, at Croton Point, may afford some interesting suggestions to grape culturists:

The vines are trained on wire trellis, about eight feet high, supported mostly by chestnut posts, but some by locust. Since timber has become costly, the posts are placed about twenty feet apart; and the vines being about ten feet apart in the row, two occupy the spaces between the posts. Three wires are used, the upper being eight feet high, and the other two about two and a half feet apart, leaving a space of three feet next the ground.

This space is considered essential to the proper circulation of the air. A less height for the trellis was found to cramp unnaturally the growth of the Isabella vine; and by raising the trellis from six to nine feet, the product of the vine was doubled. A light stool ladder is used for gathering the upper branches.

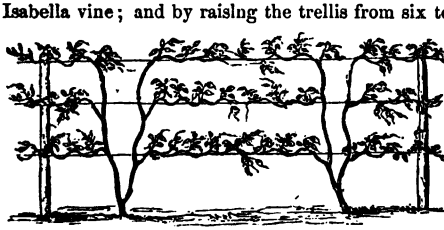


Fig. 30.—*Isabella grape, as trained at Croton Point, as seen early in summer, after the second thinning, and before the shoots have made much growth.*

The mode of training—the result of many years experience—is exhibited in the annexed sketch, (fig. 30.) The two upright branches of the vine are permanent, and remain as long as the vine lasts, unless accident or injury should require the removal and renewal of one of them. A horizontal cane is trained along

each wire, and is commonly renewed every year, bearing shoots growing on last year's wood. These canes furnish the fruit-bearing shoots, which are commonly thinned out so as to be from ten to fifteen inches apart. They are allowed to grow their full length, without being stopped, unless it be the first of autumn, and commonly attain a length of some three or four feet. The weight of the fruit ultimately gives them a drooping position. The space between the rows or trellises is commonly eight feet; on rich land a greater width is required, and on a poor soil less will answer. W. A. UNDERHILL informed me that a fertile soil is by no means desirable, causing too great a growth of the vine, less productiveness, fruit inferior in flavor, and a greater liability to winter-killing; while more room than is profitable must be given to the vines. He would never plant a vineyard on land that would produce more than fifty bushels of corn per acre, and less would be better. He has some good vineyards on soil that would produce only about twenty bushels per acre. Nearly all the soil here is quite light, being primitive sand and gravel—he thinks on the strong rich soil of Western New-York the trellises should be at least twelve feet apart. The warmth of his soil may be judged by the fact that last year he raised seventy bushels of sweet potatoes, and that some years ago he loaded twenty sloops with water-melons from thirty acres. Both he and the Dr. have found little or no advantage in deep sub-soiling, the increased growth being rather a detriment. The great requisite appears to be to keep the soil constantly stirred and mellow, by passing the harrow or cultivator through, after every considerable rain.

Dr. UNDERHILL informed me that his routine of work had been about as follows:—His men commenced trimming soon after the middle of winter, and continued, as the weather admitted, until the frost was out of the ground in the spring. The spaces between the trellises can then be plowed, throwing the earth towards the centre and away from the vines, and running the plow rather shallower as it approaches them—although tearing the roots slightly is considered no disadvantage. Plowing the earth away from the vines is regarded as favorable to the admission of the warm rays of the sun. He showed me a vineyard, planted on sloping wet ground, which did not succeed well; but placing a tile drain three feet deep, midway between the trellises, has made it an excellent vineyard.

Some of the vines in these vineyards are thirty years old, and are three or four inches in diameter. They improve in value with age, or at least they have done so up to the present time.

Dr. UNDERHILL has a fine grape avenue over one of his carriage roads, made by erecting posts sixteen feet long, or twelve feet above ground, and sixteen feet apart. Wires are stretched across from the tips of these posts, and support horizontal vines. On one side a vine is planted at the foot of each post; on the other, a branch at each post is brought from the adjacent common trellis. The annexed cut, exhibiting a single pair of these posts,

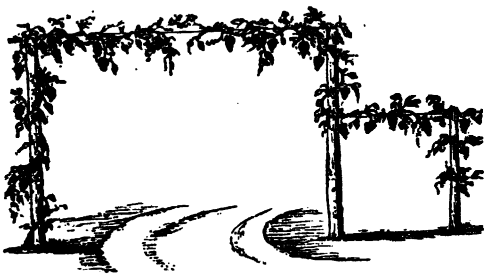


Fig. 31.—*Grapes trained in an avenue over a carriage-way approaching the residence of Dr. Underhill, at Croton Point.*

(fig. 31,) serves imperfectly to represent the appearance of this avenue. Where the ground is rather rich it is found useful thus to give the adjacent vines a chance to extend themselves; and W. A. UNDERHILL showed me where he had in a similar way extended the vines over the strip of land on which the horses turned in cultivating it. The grapes thus obtained over this otherwise vacant piece of land, amounted to sixty dollars in a season.

I should have remarked, when speaking of the mode of training adopted here, that the horizontal mode is believed to be by far the best, and favoring great productiveness in connection with moderate growth. As the soil is never uniform over a whole field, and plants differ in vigor, some discretion must always be exercised in training and thinning. If the shoots are rather feeble, more thinning is required; and where last season's canes are unusually luxuriant, they are twisted around the wires early in spring—the apparent cracking or breaking in performing this work never injuring them. In cases where the horizontal canes have not made sufficient growth, the older wood is allowed to remain for a time.

THE TURKEY—ITS HISTORY, &c.

[Written for the ANNUAL REGISTER, by C. N. BEMENT.]

The turkey is the most recent, and, except the hen, the most valuable of domestic birds. It was unknown before the discovery of America by Fernandez. It is indigenous to this country—a real Native American. It is one of those fowls that as yet are found in a wild as well as in the domestic state. How long this may be is a mystery; probably not long, for as civilization and improvements advance they will doubtless share the same fate as the Indian and Buffalo.

BUFFON remarks, "as the turkey was unknown before the discovery of America, it has no name in the ancient language." The Spaniards called it

Fig. 1.—*The Wild Turkey.*

pavon de las Indias—the peacock of the Indias—because its tail is like a peacock.

The natural habitat of the wild turkey extends from the north-western territory of the United States to the Isthmus of Panama, south of which it is rarely found. In the states of Michigan, Ohio, Kentucky, Illinois and Indiana, they were more abundant than at present, but like the Indian and buffalo, they have been compelled to yield to the destructive ingenuity of the white settlers, often wantonly exercised, and seek refuge in the remotest parts of the interior.

Audubon observes;—"The great size and beauty of the wild turkey, its value as a delicate and highly prized article of food; and the circumstance of its being the origin of the domestic race, render it one of the most interesting birds indigenous to the United States of America. The flesh has an excellent flavor, being more delicate, juicy and highly-prized than that of the domestic turkey. The Indians value it so highly that they term it the white man's dish."

The plumage of the wild turkey is generally described as being compact, glossy, with metalic reflections; feathers double, as in other gallinaceous birds, generally oblong and truncated; tips of the feathers almost conceal the bronze color. The large quill coverts are of the same color as the back, but more bronzed with purple reflections. The lower part of the back and tail feathers are of the same color, undulating, barred, and minutely sprinkled with black, and having a broad blackish bar towards the tip, which is pale-brown and minutely mottled; the under parts duller; breast of the same color as the back, the terminating black band not so broad; sides dark colored; abdomen and thighs brownish-gray; under tail coverts blackish, glossed with brown, and at the tips bright reddish-brown.

The plumage of the male is very brilliant; that of the female is not so brilliant or so beautiful. When strutting about with tail spread, displaying itself, this bird has a very stately and handsome appearance, and seems to be quite sensible of the admiration he excites.

Dr. Bachman says that "in a state of domestication, the wild turkeys,

Fig. 2.—*The Domestic Turkey.*

though kept separate from tame individuals, lose the brilliancy of their plumage in the third generation, becoming plain brown, and having here and there white feathers."

THE DOMESTIC TURKEY.—We have spoken of the turkey of nature; we will now treat of the turkey of art—that is the domestic turkey, that makes so interesting a part of our rural economy. They are, next to the common fowl, the most important, useful and valuable of domestic birds, and at the same time that which requires the greatest care in the first months of its existence. When once reared, however, every temperature seems to agree with it.

To describe the domestic turkey is superfluous; the voice of the male, the changeable colors of the skin of the head and the neck, his proud strut, with expanded tail and lowered wings, jarring on the ground; his irascibility, which is readily excited by a red or scarlet color, are points with which all are conversant. Turkey-cocks are pugnacious and vindictive, and ill-treat the hens. They have been known to attack children; and combats between them and the game-cock have taken place, in which the latter was more oppressed by the weight of his antagonist than by his gladiatorial skill; in fact the bulkey hero has been worsted, as he cannot use his spurs with the address exhibited by the game-cock, which, moreover, fights with method.

The antipathy which the turkey-cock entertains for anything of a red color is well known; and, indeed, will never be forgotten by the writer, who at about the age of eight years, having on a red flannel garment, was chased by two of them around a very extensive yard to our most terrible affright and discomfiture.

The adult turkey, it is well known, is extremely hardy, and bears the rigors of our coldest winters with impunity, even in the open air; for, during the severest weather, flocks will frequently roost at night upon the roof of a barn or the branches of tall trees, preferring such accommodations to in-door roosts. The impatience of restraint and restlessness of the turkey render it unfit company for fowls in their dormitory; in fact, the fowl-house is altogether an improper place for these large birds, which require

open sheds and high porches, and altogether as much freedom as is consistent with their safety.

Although turkeys will roost, even during the winter months, on trees, it is by no means recommended that this should be allowed, as the feet of those birds are apt to become frost-bitten from such exposure to the air, on the sudden decline of the temperature far below the freezing point. It must be remembered that the domestic turkey, hardy as it is when adult, is not equal, in point of endurance, to its wild relative, bred in the woods and inured to the elements.

Turkeys are fond of roaming about pastures, fences and the borders of fields; they love to visit turnip patches, where, besides the leaves of the turnips, which they relish, they find insects, snails, slugs, etc., which they greedily devour. They feast on grasshoppers. In the morning they should have a good supply of grain, and after their return from their wanderings another feed. By this plan not only will the due return home of the flock be insured, but the birds will be kept in good store condition and ready at any time to be put upon fattening diet. Never let them be in poor condition—this is an axiom in the treatment of all poultry—it is difficult, and takes a long time to bring a bird into proper condition which has been penuriously fed or half starved.

To the careful observer its habits are interesting, although somewhat eccentric; and what is greatly in their favor, the more we study these habits the more we are pleased with them. There is one trait in the male that is never unobserved. His shouts of exultation when surrounded by female companions, and when calling together their broods of young, may sometimes be heard half a mile. It is wonderful to observe how the little progeny will respond to his voice, if at a distance of twenty or thirty rods in the rear, as led by him in their daily explorations for food, and especially at the close of day, when returning for repose at their usual place of rendezvous and spending the night. It cannot be denied, however, that in this latter respect turkeys are deficient in punctuality, and are sometimes overtaken by night before reaching home. If so, they make an encampment wherever they happen to be. But this is not the result of indifference to home, but a defect in the science of geometry, not remembering how far they have wandered from it, or to a deficiency of astronomical observation, not having observed how rapidly time had sped.

The well-fed male turkey, especially if rendered sociable by a numerous family of female attendants, is a very important character about the homestead. No one is more tenacious of his rights or more complacent in the enjoyment of them. He is an original character, truly; but he has numerous imitators. The incessant pompous display of his plumage has ever been deemed an appropriate counterpart of the human exterior embellishment to attract attention beyond any claims founded on intrinsic merit. We cannot

Fig. 3.—*The Bronze Turkey.*

fail to be amused on seeing either of these animals of the masculine gender thus struggling for the ascendancy; but we cherish less respect for the one in broad-cloth than his prototype in feathers. Indeed, the latter, although not celebrated for his endowments, presents more intelligence than is usually attributed to him; and, moreover, as the representative of his family, occupies no inferior rank in respectability or elements of being useful. He is led by instinct, if not by reason, to be a pattern of devotion to the safety of the community of which he is the legitimate head. He watches over the turkey chicks with the assiduity of the most faithful shepherd when guarding his flocks. He will never leave them; and is apparently unmindful of his own wants, so long as they require his watchful care.

THE BRONZE TURKEY.—The domestic turkey can scarcely be said to be divided, like the common fowl, into distinct breeds, although there is considerable variation in color as well as in size; but no dwarf race exists, unless we except the small, delicate-fleshed turkeys of Hempstead Plains, Long Island, which are said to weigh, when dressed, not more than four or five pounds.

RICHARDSON says "there is a question whether the domestic turkey is actually a second and distinct species, or merely a variety of the wild bird, owing to the diversity of its aspect to circumstances dependent on locality and consequent change of habits, combined with differences of climate and other important crosses, which we know in the case of other animals produce such remarkable effects."

BUFFON and others assert that "there is but one species of the turkey;" in this country we have several varieties, known by their color, viz:—the black, the bronze, the pied, the slate, the ashy-gray, the white and the copper-color.

The ashy-gray and copper-color are not particularly remarkable, but the black and bronze are decidedly superior in every respect, not only as regards greater hardiness and consequent greater facility of rearing, but as acquiring flesh more rapidly, and that being of the very best and primest quality. Those of this color, particularly the bronze, appear to be less far removed than the others from the original wild stock.* Fortunately, too, the black and bronze seem to be the favorite color of nature, and they are produced far more abundantly than those of any other hue.

As to the relative value of the ordinary varieties, it would be almost difficult to offer an opinion; but those who suppose the white turkey to be the most robust and most easily fattened are decidedly mistaken, both in theory, as far as analogy may guide us, and in practice, where the certain test of experience has shown to the contrary. The pied and copper-colored varieties are generally undersized, and are among the most difficult of all to rear; but their flesh is certainly very delicate, and perhaps more so than that of any other kind—a circumstance, however, that may partly result from their far greater delicacy of constitution, and the consequent extra trouble devoted to their management. The finest and strongest birds are those of a bronze-black, resembling, as closely as possible, the original wild stock. These are not only reared the most easily, but are generally the largest and fatten the most rapidly. Some turkeys are of a coppery-tint, some are of a delicate fawn-color, others are pied or parti-colored, gray and white, and some few of a pure snow-white. All the latter are regarded as inferior to the black and bronze, their color indicating something like degeneracy of constitution, if not actual disease.

THE WHITE TURKEY.—The varieties of the domesticated turkey are not very distinct; the most so is the white, which are very elegant creatures, and though the most tender of all to rear, are not so in anything like the same degree as the white pea-fowl. It is well known that most birds, wild as well as tame, occasionally produce perfectly white individuals of more delicate constitution than their parents. We cannot doubt that the selection and pairing of such is the way in which the breed of white turkeys has been established and kept up. However, with all care they will now and then "cry back," and produce speckled or pied birds; and so show a tendency to return to their normal plumage. It is remarkable that in specimens which are snow-white the tuft on the breast remains coal-black, looking in the hens like the tail of a mink, and so showing as a great ornament. The head and caruncles on the neck of the male are, when excited, of the same blue-white

* A few years ago, Rev. R. H. AVERY, of Wampsville, N. Y., exhibited a cross of the wild and tame turkey, beyond competition; the largest weighed 33 pounds, and several others 30 pounds each. Their plumage almost vied with the peacock in brilliancy. These are supposed to be the origin of the now famous bronze turkeys; and such turkeys would ornament the palace of Queen Victoria.

Fig. 4.—*The White Turkey.*

and red hues. Thus the creature, with small portions of black, blue and scarlet relieving his snowy and trembling flakes of plumage, is truly beautiful; and some few keep them in spite of the disadvantages attending them. A merit is they are most temptingly white for market.

Management.

A knowledge of the natural habits of the turkey is of the greatest importance in guiding us as to its treatment, in a state of domestication; and we, accordingly, should avoid condemning to the confinement of close, and often filthy fowl-houses, a bird which, in a state of nature, always perches in open air. Open sheds and high perches are what they require; and this dislike to the mode of housing we speak of, may be recognized in the eagerness with which they rush out the instant the door is opened in the morning.

Choice of a Cock.—He should be vigorous, broad in the breast, clean in the legs, with ample wings, and a well developed tail plumage; his eyes should be bright, and the caruncled skin of the neck full, and rapid in its changes of color. Though capable of assuming his legitimate rank among the hens when a year old, he is not in perfection until he has attained his third year and is entering upon his fourth, and he continues in his prime for three or four years. Thus for two, three or four years, or longer, may all the young cocks be devoted to the spit, one, perhaps, of particular beauty being preserved within that space of time for the adornment of the farm-yard.

Choice of the Hen.—The hen should be like the cock in plumage—those with white feathers appearing amidst the black should be rejected; her figure should be plump, and her actions lively and animated. The hen breeds when a year old, or rather in the spring succeeding that in which she herself left the egg; but she is not in her prime until the age of two or three years, and will continue for two or three years more in full constitutional vigor. Whether the breeder prefers to keep a store flock for several years, or prefers a yearly or biennial change, will depend on his views and the general practice

of the neighborhood around him; most persons would keep a first rate cock for three or four years, or even longer, however they might change the store-flock of hens; and, indeed, if these produced first rate chickens it would be a pity to substitute younger birds in their place. Of course the stock, whatever its prescribed number may be, should be kept up, deficiencies by death and accidents being duly supplied.

Number of Hens to One Cock.—The number of hens to a cock is disputed by many. Some seem to think that when one has a certain number of turkeys it is indispensable to have a proportional number of cocks; and is of opinion that one cock will be sufficient for ten or twelve females, and in this number he cannot be far out of the way, if one treading is, as some seem to think, proved by experiment, sufficient to fecundate all the eggs of one laying. So satisfied are they of this fact that they think one cock may be disposed of, and sold after the hens begin to lay. Others advise that six hens to one cock may do no harm; and mention it as a common practice with some to keep a cock for the use of their neighbors who may have a few hens, rendering it too expensive to keep one.

Laying and Hatching.—Early in April the turkey-hen may be seen prying about into quiet, secret places to lay in, often stealing far from home. She indicates this coming event by a peculiar cry, by strutting about with an air of self-satisfaction, and often by peering into out-of-the-way places, evidently in quest of a secure spot for incubation; for her instinctive dread of the male is not removed by domestication, nor has the male lost that antipathy to the eggs which is his characteristic in a state of nature. She should now be carefully watched, and some management is required in order to find her nest, which generally may be found in a cluster of brambles, thickets or shrubs, or at the foot of a tree or stump. It is generally in the morning that the turkey-hen lays, and mostly every other day, though some lay daily until the number of eggs amount to from fifteen to eighteen. As the eggs are laid it is well to remove them, leaving a porcelain egg as a decoy until the number is complete, as they are liable to be broken, chilled by late frosts, or to be sucked by rats, weasels or skunks. On leaving her nest she is careful to cover the whole with dry leaves, so artfully disposed as to render it difficult even for one who has watched her movements to find the nest, and on returning to it she varies her route, scarcely ever returning to it twice by the same course. Hence it is mostly by accident that the nest of the hen is discovered.

Incubation.—The determination of the turkey-hen to sit will be known by her constantly remaining on the nest, though empty; and it is seldom in a position sufficiently secure against the weather, or depredations of foxes or skunks, and pilferers. A nest should be prepared for her by placing some straw with her in a box or half-barrel, in a convenient out-building. She should then be brought home and gently and kindly placed upon it. It is a

most pleasing sight to witness the satisfaction with which the hen takes to her nest and long-lost eggs, turning them about, placing them with her bill in the most suitable positions, packing the straw tightly about and under them, and finally sinking upon them with the quiet joy of anticipated maternity.

In about four weeks the little birds will be hatched; and now as they have fairly entered on life, what must be done with them, and how are they to be reared? This demands consideration. Were she in the woods, wild and undomesticated, leave them to the care of the mother, for nature is the best guardian and provider. But she is under our protection, and in our hands is the destiny of her offspring. Give them nothing; do nothing for them; let them be in the nest, under the shelter of their mother's wings, at least eight or ten hours—if hatched in the afternoon, till the following morning. We must, however, do something for them at least after they are one or two days old, or they will perish by starvation. In doing this, however, avoid the too frequent and mischievous practice of stuffing them with Indian meal, moistened with water. They are but tiny birds, with delicate constitutions. In a state of nature, ants' eggs are eagerly devoured by them; hard-boiled eggs, chopped fine, with curd or thickened milk, we have found a good substitute. Crumbs of bread, moistened in milk and water, is excellent food for them.

When first hatched, some say plunge them in cold water to strengthen them; those that survive will most assuredly be hardy birds. Others say, make them swallow a whole pepper-corn; which is as if we should cram a Spitzenburgh apple down the throat of a new-born babe. A few advise that they be taken away, and be kept in a basket by the fire-side, wrapped in flannel or wool, for eight or ten hours. Why take them away from her? She has undergone no loss nor labor; she wants no rest, having had too much of that already. All she requires is the permission to indulge, undisturbed, the natural exercise of her affectionate instinct.

The time the turkey-hen may be allowed full liberty with her brood, depends so much on season, situation, etc., that it must be left to the exercise of the keeper's judgment. Some, whose opinions are worthy of attention, think that, if the young are thriving, the sooner the old ones are out with them the better, after the first twelve or fifteen days. A safe rule may be fixed at the season called "shooting the red," a "disease," as some are pleased to call it; being about as much of a disease as when the eldest son of the turkey's master and mistress shoots his beard. If let loose at this time they will obtain much by foraging, and they will be thankful for all you choose to give them. They are entomologists, and devourers of insects. Did you ever observe them when they espied a bug or fly, and notice with what precision and unerring aim they pounce upon and seize it? They should, for two or three weeks, be kept in a dry place, under cover, and they may then be

placed out of doors, in some enclosure, to keep them from rambling. The best way to confine the mother is to place a crockery crate over her, at the sides of which the little ones could have an easy passage in and out. To confine the young and prevent them from going abroad before the dew is off in the morning, boards may be placed at the sides and ends, and secured by driving stakes in the ground. The top should be covered with boards, also, to protect them from rain. They may now, if the weather be fine, be allowed a few hours liberty during the day; but should a shower threaten, they must be put immediately under shelter. A severe shower or long continued rain is sure to thin them off rapidly. This system must be persevered in for five or six weeks. By this time they will know how to take care of themselves. On the first drop of rain they will run for shelter into their accustomed place of refuge, which must be warm and water-proof. As they get older, grain may be given them freely. They now begin to search for insects, and to dust themselves in the sand. At the age of two months or more, the males begin to develop their distinctive character; the red caruncled skin of the neck and throat assume a marked character; this is a critical period. The system requires a full supply of nutritious food, and good housing at night is essential. The time of danger is now over, and they become independent, and every day grow stronger and more hardy. They now fare as the rest of the flock, on good and sufficient food, if their keeper is alive to his own interest.

Now is the time that turkeys begin to be troublesome and voracious. What can you expect from a creature that is to grow from the size of a robin to twelve or fourteen pounds, in eight or nine months? Corn-sacks, oat-bins, barn-swallowers, ill-neighbors, are epithets deservedly earned. They will jump into the potato-gound, scratch the ridges on one side, eat every grub, wire-worm or beetle that they find, and every half-grown potato. From thence they will proceed to the rutabagas; before the bulbs are formed they will strip the green from the leaves, thereby checking the subsequent growth of the root. They are seldom large enough to make much havoc among the standing corn, as cocks and hens, or they have not yet acquired a taste for it; but when the corn ripens in October they will exhibit their graminivorous propensities, to the great disadvantage of the farmer. The farmer's wife sees them not, says nothing, but at Thanksgiving or Christmas boasts of the large amount of her turkey money. The reader will at once perceive there is *care* in all this, but when Thanksgiving and Christmas come—to say nothing of all the Sunday roasts during winter, our care is lost in enjoyment, and we come to the conclusion that *turkeys are worth raising.*

A SHEEP BARN.

Good managers of sheep have long since discovered that the most economical investment is for the erection of buildings for shelter. The amount of food consumed is less, and the growth of wool is much greater, while casualties rarely occur when these animals are protected from the weather. At the present time, when the price of wool is so high, sheep-raisers feel an additional interest in the subject; and frequent inquiries are made for the best plans of sheep barns.

Among some of the plans which we have examined, we particularly recommend the following:

The barn is a two-story building; consisting of a stone basement set in a hill-side, on which rests the frame structure above. The basement, (fig. 1,) is built on the south side of a hill-side, and consists of a stone wall on three sides not less than seven feet high; the front, facing the south, consists of a board partition and two wide doors, say seven or eight feet wide, hung so as to rise and fall when opening and shutting. The arrangement for this purpose is easily effected by means of counter-poising weights, which may be either of hewn stone, set with iron hooks, or small, stout oak casks, filled with broken cast-iron and sand. For determining the proper amount of weight for balancing the doors, the latter may be first weighed, or their weight calculated very nearly by allowing about thirty-two pounds to the cubic foot, if they are made of white pine, as they should be. The weights, if of lime-stone or sand-stone, will weigh about one hundred and fifty pounds per cubic foot. The mixture of cast-iron and sand will be a little over three hundred pounds per cubic foot. Any one understanding arithmetic will easily determine very nearly the size for the weights, and an accurate adjustment may be afterwards made by adding to or taking from them.

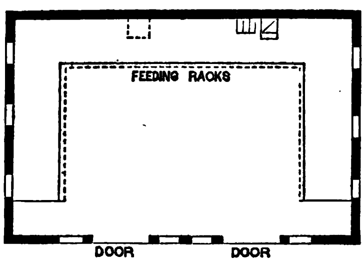


Fig. 1.—*Basement.*

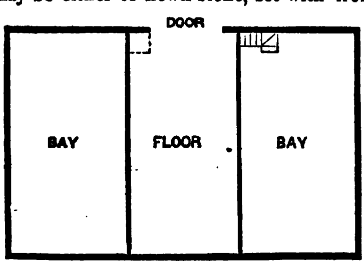


Fig. 2.

They should be hung with small chains running over stout cast-iron wheels or pulleys. Doors thus made are easily opened and shut without being impeded by snow or accumulations of straw or manure, as might be the case with doors hung on hinges or running on rollers. They may be opened to any desired height, so as just to admit sheep and exclude cattle and larger animals.

On the three sides of the apartment enclosed in the basement, and six or eight feet from the walls, are the feeding racks, as shown in the cut, (fig. 1, p. 189.) If more space is desired for the sheep, there may be but one line of racks, extending the length of the apartment. The dotted lines show the place of the trap-door where the hay is thrown down from above, and it is then carried along the alley by the attendant and readily placed in the racks, the sheep being excluded from the alley. The stairs are placed at the corner of the floor above, and afford ready access from one part to the other.

The second floor, (fig. 2, p. 189,) needs but little explanation. The hay is drawn in at the door, (an embankment being made against the wall for this purpose,) and pitched into the bays on either side. For the purpose of ventilation, a window is placed in the upper part of each gable, which is opened and shut by means of a cord running over the necessary pulleys, and extending down to the floor.

The size of this barn may be varied according to circumstances. If thirty by forty feet, the floor may be fourteen feet wide, which will leave each of the bays thirteen by thirty feet, or three hundred and ninety cubic feet in each for every foot of rise. Consequently these bays will each hold about one ton of timothy hay for every foot and a quarter, and if the posts are fourteen feet, they will contain each about fifteen tons, if stored to the peak, or about ten or eleven tons of clover hay. This will be more than an ample supply for all the sheep that can be profitably kept in the basement.

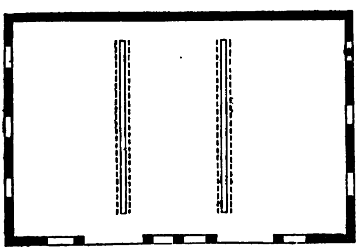


Fig. 3.

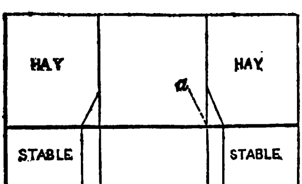


Fig. 4.

A modification of the plan is shown in fig. 3, and will be preferred by many. It consists in placing two lines of two-sided racks, one under each edge of the floor above; a row of trap-doors along the sides of the floor admits of these racks being filled without going below.

The best way of forming these trap-doors is shown in fig. 4, (p. 190,) the doors being made to swing down to the floor when open, and to shut up against the base of the mow when closed, as shown at *a*.

BEE MANAGEMENT.

WRITTEN FOR THE ANNUAL REGISTER BY L. L. FAIRCHILD.

[In the second and third volumes of RURAL AFFAIRS will be found two short articles, from the pen of M. QUINBY, on Bee-Management and on Movable-Comb Hives; and also another article describing the management of CURTIS COE in relation to swarming, constructing honey-boxes, &c. The following pages contain some interesting and valuable suggestions for the beginner, in addition to what has been already published:]

If an average of five persons constitute a family, and there are ten millions of people living in the rural districts of the United States, then there would be two millions of separate households. If each house had its hive of honey-bees, and it produced an average surplus of twenty pounds of virgin honey, at fifteen cents per pound; it would give each family an income of three dollars. Each hive, on average, would throw off one strong swarm yearly, which would be worth at least three dollars more, making the income from one hive six dollars—not an unreasonable estimate, where bees are properly understood and cared for. This would make an aggregate of twelve millions of dollars in the United States. But when we consider that every family in the rural districts need not be confined to one hive, but may have its half a dozen or upwards, we easily comprehend that it may be a source of domestic economy and national wealth that can be counted by the tens of millions. It is estimated that the bees of Austria produce enough yearly to pay all the taxes of that heavily burdened country. The government of Russia, seeing the importance of bee culture as a source of national wealth, has established courses of instruction, where her subjects are taught the science of bee-keeping at the expense of the national treasury. If the following hints serve to draw inceeased attention to the cultivation of this honey producing insect, the object of the writer will be attained.

THE QUEEN is the only perfect female bee in the hive, and lays all the eggs from which are produced workers. During preparations for swarming, she deposits eggs in drone and queen cells, from which males and queens are developed. There seems to be no difference between the eggs for a worker or a queen. The kind of cell and food fed to the larvæ, producing a worker or queen, according as the case may be. The fertility of the queen, in the hight of the breeding season, will average fifteen hundred eggs per day.

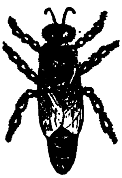


Fig. 1.—*Queen.*

Her laying is not confined to the summer season, but she has more or less brood the year round, with, perhaps, some short exceptions during the very coldest weather, or a dearth in the honey harvest. She generally dies in her fourth or fifth year. She may be known by her longer body and shorter (in proportion) wings, than the worker, having a more wasp-like form of a golden color underneath, with a slightly darker back. Her body is longer than the drone, but not so large. She can be handled with perfect impunity, as she never uses her sting except in combat with her rivals.


Fig. 2. *Worker.*

THE WORKER BEE is an imperfect or undeveloped female bee, and forms the bulk of the population of a hive. A hive may contain from fifteen to fifty thousand workers, more or less, according to season and circumstances. The workers gather all the honey, pollen and bee-glue, carrying the latter in little baskets on their thighs, the former in a little sack, sometimes called the first stomach. They secrete the wax from honey, feed the young, clean the hive; in short perform all the labor except laying the eggs. Their lives, in the working season, are short, being an average of only about two months. During the winter, when their labors are suspended, they may live six months, or even more. Notched and ragged wings are signs of old age in the worker.


Fig. 3.—*Drone.*

THE DRONES are the male bees of the hive, and their only known use is to fertilize the queens, when out on their wedding excursion. This takes place when on the wing. The queen never leaves the hive, except to meet the drones or lead off a swarm. A few drones answer all the purposes of an apiary, and the careful apiarian will avoid breeding them largely, as they are idlers and useless consumers of large amounts of honey, when their numbers are large. The bees kill them off when the honey harvest fails, or swarming is over. The drone has no sting.

BREEDING.—After the queen deposits the egg, it takes an average of about twenty-two days before the worker comes forth a perfect insect. About twenty-five days are required from the laying of the egg to the hatching forth of the drone. The time for the development of the queen is only sixteen days from the laying of the egg. The engraving, (fig. 4, p. 193,) we copy from "Nature's Bee Book," by W. A. FLANDERS, Shelby, Ohio, represents a piece of brood-comb with the different stages the eggs undergo in passing to the perfect bee:—*f*, eggs changing to larvæ; *e*, the worker cells just before the bees emerge from them; *n* shows a queen cell made by cutting down the adjoining worker cells, containing a grub three days old; *g* is the drone-brood capped over; *c* is the base of a queen cell,

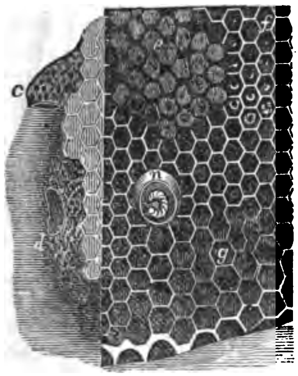


Fig. 4.

as cut down by the workers after the occupant has emerged; *d* shows where an embryo queen has been torn from her cell by a rival queen.

Fig. 5 represents the edge of a comb with queen cells attached—*b* shows a perfect queen cell, before the hatching of the queen; *a* shows a cell from which the queen has escaped, leaving the cap attached to the back edge. The queen, as well as the other bees, escapes from her cell by gnawing away the cap until she is able to force her body through the opening. These engravings are one-half the natural size, and will give a good idea of the worker, drone and queen cells. It takes about four drone, or five worker cells, for a linear inch.

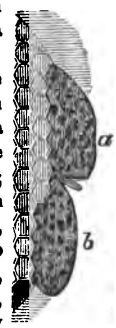


Fig. 5.

SWARMING.—No certain signs have yet been discovered to indicate the time when the first swarm will issue from the parent hive. If the weather and yield of honey are both favorable, swarms may be looked for when the bees come to be crowded for room, the hive being well filled with combs, stores and bees, and royal cells in a forward state of preparation. The old queen invariably leads forth the first swarm. In about nine days after the issue of the first swarm, a second may be looked for, if the weather and honey harvest are favorable. In about three days the third swarm may issue. The second and third swarms may vary more or less from these times, according to the state of the weather and circumstances. If the apiarian places his ear against the hive in the evening or morning, when the bees are quiet, in about a week from the issue of the first swarm, he will be likely to hear piping, ("peep," "peep,") if the bees intend to issue in a day or two. If the sound is not heard, attend and listen for several evenings. As soon as piping is heard you may expect the second swarm as soon as the second or third day thereafter, the weather permitting.

Fig. 6 represents a clustering device for swarms to alight upon. It is made of a block of wood, shaped as represented, and covered with a piece of black cloth or felt hat—or it may be stuffed with straw or other material, with a wire hook inserted to hang in a shady place, on the limb of a tree or bush, near, and in plain sight of the hives. Several of these devices may be placed in different parts of the apiary. If a few dead bees are strung upon the device, swarms will be more likely to settle upon them. Those

Fig. 6.

using them report good success in having their swarms cluster on these decoys. In hiving they are very convenient, as they are easily detached from the limb, without disturbing the bees, and taken to the hive and shaken down before the entrance or into the hive.

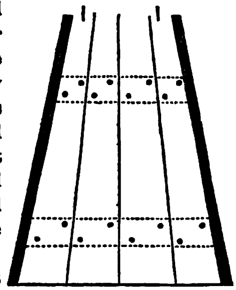


Fig. 7.

Fig. 7 represents what the Germans call a "bee-course." It is made of half-inch pine boards, secured by battens or cleats, and is about four feet long and two feet broad at the widest end, and tapering down to the width of the hive it is designed to accompany. Strips are nailed upon each edge, raising about two inches above the surface of the board, so as to guide the bees to the entrance of the hive. In use, the widest end is placed upon the ground and the other supported on a level with the bottom board of the hive by two strips of hoop iron, projecting from the upper surface and resting on the bottom board. It is very convenient in hiving swarms. By shaking the bees near the lower end and dipping up a few and placing them near the entrance, they will set up a call, when the remainder will commence marching up the "bee-course." By keeping a sharp look-out, the queen can be seen as she marches up the board to enter the hive. May, June or July, may be the chief swarming months, according to locality and season, and the condition of the stock in the spring. Very few swarms fly away to woods from apiaries that are carefully attended. The careless and negligent bee-keeper often loses some of his best swarms from this cause. If swarms attempt to leave, throw water and dirt among them, and it will prove much more effectual than all the outlandish noise you can make. Use hives perfectly sweet and clean, and use no salt or herbs in their preparation. A swarm may be prevented from leaving by contracting the entrance to *exactly five thirty-seconds* of an inch. This allows the workers to pass, but confines the queen. Without her the bees will never leave. A strip of tin can be tacked over the entrance, leaving a space five thirty-seconds of an inch between it and the bottom board. In case of second and third swarms, it should be removed the third or fourth day, to allow the queen to fly out to meet the drones.

Artificial Swarms, equal in value to natural swarms, can be made by those having the movable-comb hive. It should only be practiced when the bees are gathering honey abundantly, and there are plenty of drones to mate with the young queens. A little before, or about the time of natural

swarming, is the time to practice it. A good way is to make one good swarm from two strong stocks. Take the combs from hive No. 1, and shake the bees back into the hive, brushing off with a wing any that may remain after a shake or two. Put these combs, destitute of bees, into a new hive. Leave one comb, containing eggs and brood, and the queen, in the old hive. Put in empty frames to fill the place of those taken out, and leave the hive on its old stand. Remove a strong stock No. 2 to a new location, and put the hive containing the combs taken from No. 1 on the stand formerly occupied by No. 2. If this is done while the bees are in full flight, those in the field belonging to No. 2 will enter the new hive containing the combs, brood and stores taken from No. 1. Finding their queenless condition, they will immediately set to work and build queen cells, and, if everything works right, will have a queen ready to emerge from her cell the fourteenth day. Plenty of brood will hatch from day to day, to keep up the strength of the swarm until the young queen commences laying. The old stock will prosper, as it retains its fertile queen and is in nearly the condition of a natural swarm. If a few frames containing empty comb could be given them, it would be a great help, as every pound of comb they build consumes fifteen or twenty pounds of honey in its elaboration. There are many other ways of making artificial swarms, but this is about the safest method for the inexperienced, and produces a moderate increase of stocks, and yields a good supply of surplus honey. It will be found very safe, and profitable in the long run. The inexperienced had better not divide or increase their stocks more than fifty per cent in any one year. Too great an increase of stocks is the rock that many an apiarian has split upon, when endeavoring to increase his apiary by artificial swarming. There is considerable of a saving to be made by rearing queens artificially, to supply every new artificial swarm; but it should only be attempted by those well versed in the natural history and management of the bee. If you give the new swarm a sealed queen cell, it will save them time in rearing a queen.

Fig. 8.

Surplus Honey Boxes, of a small size, are conveniently made, as recommended by Mr. Langstroth. The sides are glass, and the top, bottom and ends of pine, one-fourth inch thick. The top and bottom project sidewise over the ends far enough to hold the glass and allow it to be tinned or cemented in, by running melted beeswax and rosin around its edges. Glass, 5 by 6. Size of boxes, inside measure, 5 inches high, 5¾ wide and 5¼ long—holding five or six pounds in a very showy and saleable form. The size can of course be varied to suit the hive, or preferences of the apiarian. Bees will not store quite as much honey in small boxes, but it will generally sell enough better to pay the extra cost. Before putting them upon the hive, let all the corners be cemented with rosin and beeswax, and pieces of bright comb cemented to the top, to induce the bees to commence

work in them early. The larger the pieces the better. Fig. 8 represents one of this style, stored with honey.

Fig. 9.

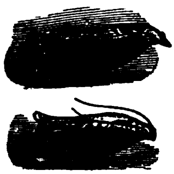
A BEE PROTECTOR, or vail, manufactured from black linen thread, with the edges sowed together, forming, when distended, a cylinder large enough to admit the brim of a hat, gathered round the crown with a string, and of sufficient length to be buttoned down under the coat or vest, forms a perfect armor against the sting of the bee. It is light, convenient, and obstructs the vision but slightly. It is immeasurably superior to the old wire bee-hat, as usually constructed. So far as the writer is aware, the honor of introducing this improvement on the old bee-hat belongs to K. P. KIDDER, Burlington, Vt. An article that will answer can be made of black barege or lace. The manner of wearing the protector is illustrated by the engraving annexed, (fig. 9.) The bee-keeper, armed with a vail, as shown in the figure, and a pair of India-rubber gloves, is perfectly safe from the attacks of a whole apiary. Old bee-masters are seldom stung, but beginners should be so protected that they can go among their bees with perfect confidence and perform all necessary manipulations with deliberation.

BEE-STINGS are seldom fatal, but very painful and annoying to some persons. If a little smoke is blown into the hive before the bees are handled, they will fill themselves with honey and will be good-natured. They will become as harmless as flies, and you can even tear their hives to pieces without their showing resentment, if you do not pinch or otherwise injure individual bees, which will resent such personal injuries by thrusting out their stings. Tobacco is the most effective and convenient article to use for smoking, and should be burned in a tube, made so that the operator can blow through the tube, directing the smoke through any orifice to any part of the hive. One or two puffs of smoke are generally sufficient to subdue any swarm. They can be bought, ready made, cheaply, or can be made by any one having a little ingenuity. Take a tube about three-fourths of an inch in diameter and two and a half long, open at both ends. Fit stopples to both ends, tapering down towards the outer ends; bore a gimlet hole through each; rim out the end (that is inserted in the tube) of the lower stopple, placing a piece of tin perforated with small holes over the end, to keep the tobacco from closing the orifice. Fasten it in by denting in the tube with an awl. The upper stopple serves as the mouth-piece, which should be left without fastening, so as to fill the tin tube, which will serve as the bowl of the pipe to hold the tabacco. When completed it will look

Fig. 10.

something like the annexed, (fig. 10.) A knob is left on the mouth-piece for convenience of holding between the teeth.

THE BEE-MOTH, or miller, and its progeny, are the pest of modern apiaries. The following engravings, (figs. 11 and 12,) show the male and female millers. The female is distinguished from the male by her bill-like head. She deposits her eggs in and around the warm portions of the hive, which soon hatch worms, as shown in fig. 13. The worms feed upon wax, and work in the centre of the combs edgewise, enveloped in a kind of tubular covering of web, so that it is with difficulty the bees dislodge them. Strong stocks will generally protect themselves. Queenless and weak stocks are the most liable to fall the prey of these ravenous worms. If you attend often to your bees, destroy all the millers and worms found about the hives or apiary; you will be quite likely to keep them in subjection. Blocks or sticks placed under the hive, having little troughs or creases cut in them, and turned down upon the bottom board, with frequent openings for the worms to crawl under, form capital hiding places. Remove these every day or two, smash all the worms you find, and replace them for more. If a hive is made snug and tight, as it should be, you will trap nearly every worm, when it seeks for a hiding place to wind up, preparatory to its change into a miller. No confidence should be placed in moth-proof hives, as a miller can go anywhere that a bee can, and move with great rapidity. Most moth-proof hives furnish an abundance of corners, cracks and crevices, for the breeding of the very nuisance they were designed to destroy. No judicious and careful bee-keeper need lose a stock by the bee-moth, if he only attends to their destruction as directed. The writer is indebted to Mr. LANGSTROTH's work on the "Honey-Bee," for the engravings of bee-moth and worm.



Figs. 11 and 12.

Fig. 13.

LOSS OF QUEEN.—If the apiarian discards bee-houses, and sets his hives here and there about his grounds with some distinctive marks about each hive, so that the young queens in their flight can easily distinguish their own homes, the loss of queens will be very few. In the summer, when the drones are in flight, a queenless stock can be furnished with a sheet of comb containing eggs, and they will immediately proceed to rear a new queen. When the drones are not in flight, the queenless stock should be united to a stock containing a fertile queen, but one not very strong in numbers.

WINTERING BEES.—Mr. QUINBY reports, in the New England Farmer, that of all the ways he has tried, the best success has attended him in wintering

in straw hives, upon their summer stands. They guard against sudden changes of temperature, give good ventilation, and allow all the moisture to pass off.

ROBBING.—Bees often learn to rob by having combs containing honey and other liquid sweets placed or left where they will attract their attention. Bees should have honey placed above them in the cap, and be well secured from intruders from other hives, if it becomes necessary to feed them. Honey should never be exposed where all the bees of an apiary can have access to it. If you discover a hive is being robbed, close the entrance so that only one bee can pass at a time. Incline the bottom board to an angle of about thirty degrees, and the bees, unless queenless, will protect themselves, with perhaps few exceptions. If any cases of failure do occur, the hive can be closed for a day or two, until the robbers give up the attempt. Ventilation must be provided, and the hive must be watched for a day or two after it is opened, as the robbers may again return to the attack.

CEMENT FOR BEE-HIVES.—A mixture of three-fourths rosin and one-fourth beeswax, melted and kept at the right temperature, in a tin dish, over a kerosene lamp, will be found excellent to cement the corners of hives, and combs into frames and boxes.

FARMING AND RURAL ECONOMY.

MOWERS AND REAPERS.—It has been ascertained that about 70,000 mowers and reapers were manufactured in the United States in the year 1864. Admitting that there were about twice as many in use, manufactured in previous years, it would give the number 200,000 in actual operation. One of these, drawn by two horses, will do the work of about ten men; that is, the labor of about a million hand-mowers and cradlers is done by these machines—not far from the number withdrawn from farms into the army. Had the present war occurred a few years sooner, or before they had been generally introduced, it must have resulted in great disaster to the farming interest. No wonder that British agriculturists are astounded at the unimpeded agricultural prosperity of the country.

FOUR-WHEELED CARTS.—A correspondent, speaking of the great advantage of using four-wheeled carts for horses, so that they may tip readily, turn short, and not chafe and oppress the horse, gives the following description of two modes of construction:—Each hind end of the tongue is inserted in the iron *a*, (fig. 3, p. 199,) and bolted with two bolts, and two eye bolts. The irons shown at *b*, (fig. 2,) are put through the axle the width of the iron *a* apart, and secured with nuts. Then a bolt is put through the eyes

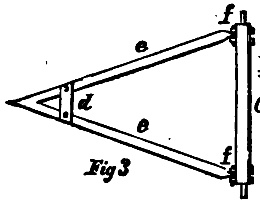


Fig 3

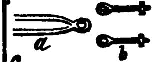


Fig 2.

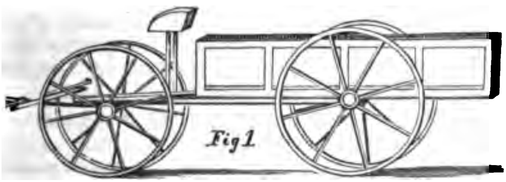


Fig 1.

in *a* and *b*, for the cart to tip on. The axle is bolted to the cart's body. Fig. 3 shows the tongue of this cart; *c* is the hind axle, *d* the rocker iron. The tongue rests on the forward axle without a rocker—simply an iron bolted to the tongue; *e*, sides of the tongue; *f*, irons which fasten the tongue to the axle. Distances between the axles 4 feet 6 inches. The tongue is made of white oak, 2 by 4 inches, or larger, according to the size of the cart. The length of each of the two pieces of which the tongue is made is 5 feet 6 inches. The hind ends of the tongue, where they are fastened to the axle, are 3 feet 2 inches apart, and the forward ends of the tongue meet in a point. The rocker iron is bolted across the tongue 9 inches from the point. The axles are of the usual length.

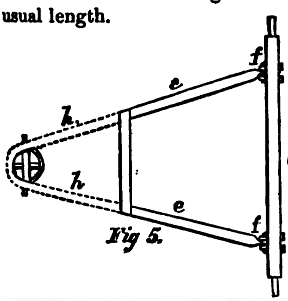


Fig 5.

In cart No. 2 the hind axle is of the usual length, while the forward axle is but 36 inches from the outside of the hubs. The tongue of the cart No. 2, shown in fig. 4, is made of white oak as far as the front of the cart body; from there to the forward axle it is of two curved irons, (see dotted line in the tongue, fig. 5.) The curved irons are 2 by 1 inch, curved high enough so the forward wheels will turn under them, similar to the wheels of a coach. The forward axle is half the length of it, with two or three inches to clear, which equals twenty or twenty-one inches or more, according to the size of the wheels forward of the cart body.

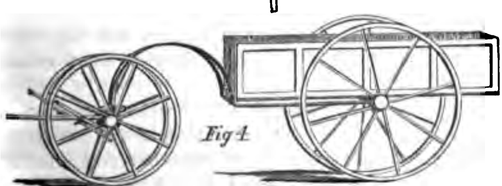


Fig 4.

VENTILATORS FOR BARNS.—The following excellent practical remarks are furnished by H. H. PETERS, of Southboro, Mass., and published in the COUNTRY GENTLEMAN:—I am reminded by the figure of a ventilator for the use of barns, in your paper of February 4th, that I am indebted to your "ANNUAL REGISTER OF RURAL AFFAIRS," of 1862, for my first idea of this plan, which I have already found of sufficient advantage to pay for the REGISTER for the next forty years at least.

I have a barn which, with the L attached, is over one hundred and twenty feet long. Until within two years it had no ventilation from the roof, though I had long been aware of its necessity, both for the benefit of the stock and the hay stored therein. Having one cupola on an adjoining barn, I was unwilling to incur the expense of building another, as a very ordinary cupola with blinds will cost fifty dollars in stock and labor. On seeing your plan for ventilators I was much struck with its simplicity and apparent efficiency, and immediately had four made—three for the main barn, twenty-two inches square on the inside, and one for the L, sixteen inches. As soon as they were put up, the improvement in the air of the barn was immediately noticeable; the rafter and roof boards that were ordinarily damp and sometimes wet from the condensed vapor, were at once dried, and the hay has since been sweeter and more free from must. The expense of these four ventilators, fitted and placed, including the cost of material, was thirty dollars; they are much more efficient in their operation than a cupola, as they take the air from four different parts of the barn, while a cupola operates only thoroughly near the centre. I am just completing a large barn, on which have been placed three ventilators of this description, each measuring two feet square in the clear; they are made of the best of lumber, and cost on the barn complete, at this time of high prices, twelve dollars each. In locating them on the building, I placed one in the centre of the roof, the other two one-fifth of the length of the barn from either end; this equalizes the ventilation throughout the building. These ventilators are rather ornamental than otherwise, giving a completeness of finish, and breaking a long line of roof. I would strongly recommend them to those persons who contemplate putting up buildings for the storage of cattle or hay. I have cupolas on two of my barns that I should be very glad to have replaced by the ventilators.

While on the subject of ventilation, I would remark on the importance of a change of air in the lean-to, or those parts of the barn where animals stand.

I have a barn ninety feet in length, on each side of which cows are tied. I used to be painfully impressed with the unhealthfulness of the atmosphere for man or beast, on going into the barn on a cold winter morning, when all had been tightly closed through the night. Hoping to make an improvement, I caused four boxes, 12 by 24 inches, to be carried upon each side of

the barn, back of the cattle, against the outside walls. These opened in the floor over the lean-to, and also on the outside of the building just under the eves; slides fitted to the lower opening regulate the draft. The plan has operated to my entire satisfaction, and with the ventilation in the roof, serves to keep the air always pure, which is no easy matter in a modern barn, containing sixty head of cattle.

One suggestion more and I have done. Much complaint is made by those having close sided or clap-boarded barns, that the hay laying near the outer walls becomes damp and mouldy. I think this may be avoided by nailing strips of board on the studs a few inches apart, which will prevent the hay touching the outside. In my own case, I have, in addition to the strips, an opening in the outer wall, near the sill in each section, six inches square; this creates ventilation, and keeps all dry and sweet.

HARVESTING CORN.—E. S. BARTLETT gives the following mode, in the COUNTRY GENTLEMAN. An improvement consists in using osier willow instead of straw for binding:—As the saving of the crop of corn depends a great deal on the manner it is harvested, it is important that the farmer should see that it is well secured against wind and rain while standing in the stook. The following is my method:—Cut six rows of corn in each row of stooks, commencing by cutting up the two middle rows, until you have a large armful, which set up between the two rows cut; tie the top with a stalk, and set it down as you would a sheaf in setting up a shock of wheat. This is the centre of the stook, and is not to be tied around a hill. Now cut up the other four rows, and as far ahead of the stook as is necessary to make a good size stook, taking care to set the stalks up straight, and to keep the stook round. When sufficiently large, tie snugly around the top, (not too near,) with a good band of rye or flax straw, and you have a stook that will stand the wind, dry out well, and when pulled down to husk, will leave no stalks standing, as is the case when set up around a hill, or four hills, as some recommend.

HOW TO MAKE CLOVER HAY.—A correspondent correctly remarks:—Clover should never be cut when wet either by dew or rain. My practice usually is to start the mower, say at 2 or 3 o'clock P. M., and cut until the dew falls. If the sun is very scorching, I begin later in the day. This is put into cock the next day, sometimes before noon, but oftener later, depending upon the weather and thickness of the grass, but always before the leaves get crispy. Sometimes I commence cutting as soon as the dew is off in the morning, and get it up the same day. If the dew or rain falls upon clover while it is green, little or no injury results from it if fair weather follows soon; but after clover is considerably dried, rain or dew cannot fall upon it without serious injury to the quality of the hay.

DEEP AND SHALLOW PLANTING OF WHEAT.—C. O. DEWEY, of Michigan, states in the COUNTRY GENTLEMAN, that he has for many years examined

many different fields; that in many instances he has found plants with a single stem, and in other instances large stools throwing up several stalks. On examination he has found that the single stems always proceeded from deeply buried seed, and the large stools from seeds slightly covered. This shows the importance of graduating the depth of seed drills so as not to deposit the seed at much depth.

Culture of Beans.—James A. McCollum, who has been very successful with this crop, gives the following directions in the Country Gentleman, by which he can raise beans at less cost than wheat, and with greater profit:—A warm, gravelly soil is the best, and if covered with a stiff sod so much the easier to keep free from weeds. Take pains in plowing it; see that every sod is turned over; roll with a heavy field roller; thoroughly harrow; then mark out your rows. For the medium bean I make the rows twenty-eight inches apart; for larger varieties thirty-two inches. I am particular to secure the best beans for seed, and all of the same variety, for it is very essential in securing the crop to have them ripen at the same time, and they sell better if they have a uniform appearance as to size, &c. Plant in drills with a bean planter. I use one that plants two rows at a time, putting on usually about five pecks of seed per acre, of the medium. Having finished planting, roll all down smoothly with a roller; it is of great benefit to the crop, especially if you have to cultivate to keep down the weeds. I use a common corn cultivator—one that is so constructed that you can shut it up close. Very often, on ground that is free from weeds, they never cultivate them, but I think in stirring the soil it will increase their growth more than enough to pay expenses. We consider the best time to plant usually from the first to the tenth of June, althouth I have seen them planted as late as the twenty-fifth, and yield a crop of twenty-five bushels per acre.

Sowing Grass Seed without Grain.—We have, for some years past, occasionally recommended the practice of sowing grass seed early in spring, without grain. This recommendation has been founded on our own experience. We have never failed in obtaining a good crop of grass the same season when the sowing has been done early enough, with ground in good order. The soil should be sufficiently mellow to cover the grass seed when rolled in. A light brushing has answered the same purpose. To cause a sufficient growth before hot or parching weather sets in, the work should be done about the time the buds of trees commence swelling, and as much sooner as may be convenient.

We find the following statement bearing on this subject in a late number of the Boston Cultivator:

"It is a mistake to suppose that grass sown by itself in spring will not yield a crop of hay till the following year. If the ground is in good order and the season is favorable, it will generally give a fair crop in three months from the time it was sown. A case in point was lately stated to us

by A. W. CHEEVER, of Wrentham. He 'laid down' three lots of ground last spring; on one he sowed oats with the grass seed, on another wheat, while the third was sown with grass seed only. The oats were cut for fodder while quite green. Yet the grass did not do well; the plants did not thrive; and many seemed to die. We understood they did some better on the wheat plot. But where the grass was sown by itself, a good crop of hay was obtained in August, and present appearances indicate that the amount of grass on this plot will be at least double, the present season, to what will grow where the oats grew. Mr. C. states that the ground was of similar character and was treated in the same way. He doubts—as he well may—whether, where hay is worth $20 per ton, it is economy to sow any kind of grain with grass seed."

TIME FOR CUTTING TIMBER.—We have often urged upon our readers the importance of cutting rail and other timber in the summer. Experiments of our own, and frequent observation, have satisfied us that soft wood, cut when the bark peels from it freely, and when it will rapidly season, lasts at least twice as long as winter or spring cut timber. The latter seasons slowly, and becomes partially sap-rotten; the former dries thoroughly and hardens like horn. There may not be so much difference in the durability of hard timber, when cut in summer and in winter. WILLIAM CONE, of Michigan, writes in the Rural New-Yorker as follows:

"In June, twenty-nine years ago, having need of a pair of bar posts, I had to cut a tree for that purpose. I cut a white oak about two feet through at the but, and split out a pair. The bark peeled off easily. I set them with the butt end in the ground. Now that pair of posts have outlasted about three sets in other parts of my farm, and the rails split at that time are much better than many that were split many years after. Now, basswood rails split in the summer, when they will peel easily, will outlast ordinary oak cut in the winter."

CLEANING SEED WHEAT.—I know, from long experience, that by washing the seed in brine as strong as it can be made, will prevent smut; it will also enable the farmer to skim out light wheat, chess, and almost anything else that may be in the seed, the strong brine bringing it to the surface much better than mere water. The wheat should, while in the brine, be stirred as long as any foul seed or light wheat rises; one bushel at once in a barrel is sufficient, with plenty of brine; then dip brine and wheat into a basket. When drained a few minutes, empty on a clean floor; take the same brine for another batch, and so on, until you have as much as you wish to sow that day; then sift on good slacked lime gradually, while another person follows around the heap and stirs it with a shovel: put on lime until the wheat will not stick together; then let it be sown and immediately covered; the lime will then continue to stick to the wheat, and be a good manure.—J. T. ADDOMS, *in Co. Gent.*

Mowing Pasture.—The Boston Cultivator says:—We have often spoken of the advantage of keeping pastures free from the dead grass which, where the crop is not fed off, will accumulate. After grass has gone to seed, it is refused by stock, and the patches where it lies will be left, even after a new growth is started. The old grass makes the new sour and unpalatable. To keep the grass sweet, the pasture should be smoothly cleared off at least once a year. On a late visit to the farm of the Rev. C. C. Sewall, of Medfield, he called the attention of the writer and other persons to some hay which he had cut in the pastures. Finding, after many years' experience, that during the flush of feed in the fore part of the season, his cows would leave certain places almost untouched, and which were, consequently, about lost, so far as to yielding any return, he mowed them, obtaining a considerable quantity of hay.

Wire Worms.—Some of the best farmers find that the best protection from the wire worm is thorough under-draining and the application of fresh or unfermented manure. Doubtless the impetus given to the crops is a chief reason of this security.

Removing Rocks.—A correspondent of the Rural New-Yorker gives the following mode of sinking rocks:—"Dig by the side of the rock a hole large enough and deep enough to receive the stone and put it below the plow. When you have dug to the lower side of the rock, place a prop against it and the bank so as to hold it firm, and then dig under it a short distance to ascertain its size; then spade the hole to receive it. When all is ready take out the tools and pull out the prop, and if the rock does not drop a pry on the opposite side will soon drop it; then cover it over. It requires much less hard work to let a rock down than to raise it out of its bed, and the labor of drawing it away is a clear gain. The thing is out of the way, and an eye-sore no longer."

Beetle Handles.—A correspondent of the Rural New-Yorker says the best way to insert the handle of a maul or beetle, so that it will never come out nor turn, is first to bore an augur-hole through the head an inch and a half in diameter, and then cut the hole square with a chisel, making it an inch and three-fourths long on the lower side. Then make the handle to fit this enlarged part at the end, working the rest of it down to an inch and a half in diameter, and bringing the handle up through from below.

Rotation of Crops for Dairy Districts.—In a strictly dairy region of country, the production of the grass crop—pasture and meadow—is the one great subject of interest; consequently the rotation of crops, the profits of grain raising, &c., attract but little interest. If we keep our cows well, all we care to sell is our butter and cheese. If our meadows fail we plow them, taking up the parts most run out, plant corn on the sod, and seed down the next year with oats or barley, so that each year we have Indian corn and oats or barley to feed to our cows; and we buy our flour. Some dairymen, it is

true, sell their coarse feed, but the dairy suffers, no doubt, to a certain extent.

COOKING FEED.—W. J. PETTEE gives the following directions for steaming feed for stock:—How to get a good cover for MOTT'S agricultural boiler—buy a good tight molasses hogshead; saw the bottom off, say eighteen inches from the head, very true and even; saw a circular hole in the bottom ten inches in diameter, dishing, so that the piece taken out will do for a cover. When you use your boiler, fill it even full of potatoes or whatever you wish to cook; put on the cover, and fill the top full through the trap-door, and if the hogshead is of the right size and fits well on to the top of the kettle, so that but little if any steam escapes, you will find a great saving in fuel, as you can both cook one-third more, and do it with very much less fuel, than without any cover or only a loose one. My own is a two-barrel kettle, and I can cook it full of potatoes and pumpkins in two hours, with one very large handful of seasoned wood. It is all-important, however, that the apparatus should be well fitting, so as to preserve all the steam.

MARKING SHEEP.—DAVID STREET, of Ohio, gives the following directions:—I first used turpentine, linseed oil and lamb-black, stamping my initials on each sheep; in a few weeks not a mark was legible. I next tried boiling tar, keeping it hot by placing the vessel containing it in a kettle of coals. This was legible until the fleece was removed. I tried Venetian red and linseed oil, which soon became obliterated. Lastly I tried coal or gas tar, which makes a distinct and durable mark. Mark ewes on the side, wethers on the shoulder, and bucks on the rump. Sometimes stamp with my initials cut in a block of soft wood; also use a stamp cut in a circular form, making a ring; and when in a hurry use the large end of a corn cob, making one, two or three spots near together. By marking sheep of different sexes on different parts of the body, it facilitates the assorting of a flock. Last spring, marked all of my breeding ewes with copper labels, bearing a number stamped upon the face, suspended from the ear by a wire ring; but several of them are now missing, having been torn loose.

RELIEVING CHOKED CATTLE.—When the obstruction is far down in the throat, it may be carefully pushed down by a flexible rod, coated on the end by a piece of pork-rind, tied firmly on with a cord, the inner side outwards. When the obstruction is higher up in the throat, it may be removed by thrusting the arm down the throat and seizing it with the fingers. For this purpose the jaws must be he held firmly wide open, to prevent all danger of biting. The annexed figure represents a simple instrument used for this purpose, which may be made in a few minutes, and should be always kept on hand by those who are not vigilant in excluding whole apples or potatoes from their animals. It consists of a strip of board made of hard wood, *a*,

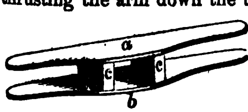


Fig. 6.

about two feet long and three inches wide, shaved or rounded at the ends so as to form handles. Two wooden blocks, *c*, *c*, are placed between this board and a similar board, *b*, so as to leave a hole or space just large enough for the hand and arm to pass through. These boards should be firmly nailed to the blocks. In using it a man stands on each side of the animal, and holds the horns, while the mouth is crowded open and the instrument held firmly by the handles. A third person, after removing his coat and rolling up his sleeves, thrusts his arm nearly full length down the throat and removes the obstruction. An active, half-grown boy, whose hand is smaller than that of a man's, usually succeeds best. The whole may be done in less than a minute's time—the writer has often performed this task without any inconvenience.

Ventilating Cellars.—Every one is aware, on a moment's reflection, of the importance of ventilating cellars—as foul air is not only detrimental to health, but is detrimental, or taints everything within its reach. During the warm part of the year, partial ventilation may be effected by opening opposite windows, but too much fresh air may render the cellar warm. One of the best contrivances, especially for winter, is to affix a branch pipe to the stove-pipe in the room above, for this purpose, as shown in the annexed figure. The pipe passing up to some height above the stove before joining, does not materially affect the draft; and all difficulty of this kind will be prevented by placing a valve at the floor, to be shut while the fire is kindled, or to be partly closed if too much air passes from the cellar, causing a cold draught from the exterior crevices. As foul air generally rises to the upper part of the cellar, it is drawn off in this way as fast as it accumulates, and the apartment kept pure.

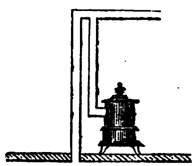


Fig. 7.

To Prevent a Horse from Pulling at the Halter.—Tie a rope around the neck, put it through a hole in the edge of the manger, and tie it around the fore leg below the knee, and when the horse pulls, the rope will slip through the hole and pull up the fore leg, and he will soon give it up.

Packing Vegetables for Winter.—There are two ways in which farmers usually deposit their vegetables in the cellar for winter, one of which, we are sorry to say is too common, is to take them up without much care, and with what earth happens to be adhering to them, and to throw them into a pile in one corner or other part of the cellar, where they remain till wanted for family use. We here allude to such vegetables as beets, carrots, parsnips, turnips, &c. If the cellar happens to be damp, many of them decay or lose their flavor; if it chances to be a dry one, a portion of them become shrivelled and too dry for use. The heaps are overhauled repeatedly to find such as are good enough for the table, and these confused and scattered heaps

present anything but a tidy appearance, while the decaying ones produce an unhealthy air.

We have adopted another way, which we like much better. A few bushels of fine clean moss is obtained from dense woods or from swamps. Clean barrels or smooth-planed boxes are taken to the garden, (a dry day being selected for the occasion,) and the vegetables being taken up, well cleaned, topped and trimmed, are placed in the barrels or boxes, with alternating layers of the soft, damp moss. When filled, the handcart or wheelbarrow conveys them to the cellar. The moss keeps them clean and sufficiently moist, preventing the accumulation of water on the one hand, and the drying and shriveling of the roots on the other. They are always fresh and ready for use, and are taken out from under the moss without the least difficulty. As the barrel is successively emptied, a portion of the moss is taken off and placed in another one for future use.

There are very few places where good moss cannot be obtained from the woods, within a reasonable distance; but if beyond reach, clean, moist sand may be substituted for the purpose of retaining the moisture. It is, however, heavier and more difficult to handle, and the vegetables do not come from it so clean and fresh as from the moss.

HOUSEHOLD MANAGEMENT.

WRITTEN FOR THE ANNUAL REGISTER BY A LADY.

WASHING CLOTHES.—Never put off washing on account of rain; it may be no drier any other day of the week.

A good washing-machine will save much labor and wear of fabrics. A good one is noticed in the first volume of RURAL AFFAIRS, page 263. The Union Washing Machine, (described in RURAL AFFAIRS, volume third, page 221,) is still better. The only requisite to complete success in working it, is to use *boiling* water. A good wringer, the Universal Clothes-Wringer for example, saves not only time and strength, but many dollars in the wear of clothing, which is always injured by the straining and twisting of wringing by hand.

Don't wash calicoes in soft soap, and never dry them out of doors; they will surely fade. Their colors may be set by washing once in soft water, in which beef's gall has been diluted in the proportion of one table-spoonful of gall to one gallon of water.

Many thousands of dollars are wasted by the careless washing of flannels. The following receipt, furnished by an experienced housekeeper, will infallibly prevent them from shrinking. Make suds of hard soap and *boiling* water;

lay in the flannels and leave them in it till the water is cool enough for the hands to bear. Then rub the flannels on a wash-board till clean; wring them out, and throw them into a tub of *boiling* water; let them lie till the water is cool enough for the hands, then rinse them in it thoroughly and wring them out. Repeat the rinsing process with another tub of boiling water, then hang them up to dry. Never rub soap on flannels. Never wash colored and white together; hang the former in the shade, the latter in the sunshine.

Do not use those clothes-pins that are made in the form of pincers, with a spring to shut the ends together. They hold too tightly, and cut holes in the clothes.

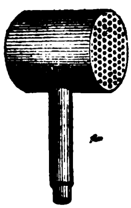


Fig. 1.—*Clothes Sprinkler.*

A simple article, called the clothes sprinkler, has been found by long trial to dampen clothes more evenly, and keep the hands dry besides. It consists of a hollow tin cylinder, about four inches long and three in diameter, closed at both ends, but having one of them pierced like the rose of a watering-pot. A tube inserted in one side admits the water into the cylinder, and forms a handle to hold while sprinkling. After filling the sprinkler, cork up the tube and shake the water over the clothes.

Washing Dishes.—Those who have cool water, and little of even that, dirty dish-cloth and wiping towels, a greasy dish-pan, and a shirking, slovenly and unsystematic way of doing, will generally dislike to wash their dishes as much as other persons will dislike to use them.

Provide plenty of hot water beforehand, and make up a good fire. Have a good supply of clean crash dish-towels. Scrape the dishes very clean, put the kettles to soak, put away the food remaining after the meal, and begin by washing the glass in clear hot water. There is no need at all of breaking tumblers in washing. Put them in the water side-wise, so that the water will run into them at once and expand them outside and inside at the same time—then they cannot crack. Wipe glass while hot, with a dry towel. After this put soft soap in the water, and provide rinsing water. Wash spoons before the crockery, while the water is clean—thus avoiding the risk of losing them among larger articles and throwing them out with the turbid dish water. Change the water occasionally while washing dishes, and it will be neater—cleaner for the dishes and better for the hands. Knife-handles never should be put in water; they should be washed with a cloth above it, only dipping in the blades. As the hands of working-women get accustomed to heat, so that they do not feel uncomfortable in water hot enough to dissolve the cement which fastens the handles of cutlery, it is best never to risk them in water at all. But India-rubber handles are considered safe, even in very hot water.

The outside of kettles should be washed as much as the inside. Scrape

iron-ware with a circular piece of tin, bent up a little on one side to hold by. The medical instrument called a "spatula," a broad knife, is equally valuable for this purpose, as also for cleaning plates, as it scrapes a much larger space at once than a common table knife.

WORKING DRESS.—It is desirable, while performing domestic labor, to adopt such a style of dress as will be perfectly convenient to work in, without being so peculiar as to attract attention. A plain calico dress, made somewhat shorter than for parlor wear, but long enough to reach at least the tops of the shoes, is most convenient in all respects. If the hoops are worn quite small, and made open in front all the way down, so as to allow perfect freedom of motion, and so that they can lap over each other when entering a narrow place, so much the better.

But a large apron, made with high neck, full waist, belt, long sleeves and long full skirt, is exceedingly valuable to slip over a nice dress when doing housework, washing supper-dishes, &c. It should be made quite loose and of a material that will wash. Fasten up your dress-skirt with a "page," put on the apron, and you may go to work without the danger of spoiling your clothes.

BED-ROOMS.—To avoid giving discomfort to guests, every spare room should possess these essentials:—A good-sized slat-bottomed bedstead, furnished with a straw bed and mattress over it, (or feather bed if the weather is cold, or the guest prefers it,) over which a soft quilt is spread, then the clean sheets, bolster, pillows and more bedding than is really needful to be warm enough, as it is easy to lay off an extra quilt, but not always easy to ask for more; a wash stand, large pitcher of fresh soft water, wash-bowl, fine soap, slop-pail, two or more clean towels, two or three chairs, matches, pin-cushion and pins, brush and comb, looking-glass, and a few hooks for hanging up garments. No bed-room should be without a Bible. Window-curtains are essential; muslin are prettiest, made with a frill or valance gathered in at the top, over the main part of the curtain. A clothes-brush, pair of snuffers and extinguishers, a pitcher of drinking water and a tumbler are often acceptable.

Cleanliness and ventilation are essential not only to the comfort, but to the life and health of the occupants. Beds, absorbing much of the insensible perspiration, need much airing and frequent change of their furniture. A straw bed is probably most healthful, as the straw can be often renewed. Mattresses should be overspread with a quilt or "comfortable," not only to make the bed softer, but because it can be washed and preserves the mattress. Sheets need very frequent changing. Feather beds need daily beating-up, and much ventilation. Many of the most particular house-heepers, from ignorance of the insensible waste of the body, leave their beds in a state of apparent neatness, but of real filth and poison.

More than two persons should not occupy the same room, on account of

the exhaustion of the air. Children are often crowded together and greatly injured in this way. The effects become apparent in loss of appetite, paleness, &c., but the cause is seldom suspected. The windows of bed-rooms should be open as much in the day as practicable, and at night if agreeable. Do not sleep with the door closed tightly.

Beds should be made higher at the head than at the foot. A hollow in the middle of a bed is a certain sign of a lazy chambermaid. A true lady will always keep her own room as neat, or even neater than those rooms which are seen by company, and never leave it in a state which would require an apology for its appearance should it be suddenly entered.

Items of Economy.—A strip of thick paper laid over the edge of each stair, under the carpet, will preserve a stair-carpet from wearing through *one-third* longer than otherwise.

Mark and number all clothing, bed-linen, table-linen, towels, &c. Count up frequently silver, knives and forks, and all articles of value or in common use.

Hull's Polishing Soap, for cleaning silver and plated ware, is a valuable article. It improves the polish more than scouring, saves time and does not wear or scratch the silver.

Clean brass kettles, before using, with salt and vinegar, to avoid being poisoned by the verdigris.

Gum tragacanth dissolved in water makes a good and cheap paste which will keep till it is used up.

Oyster kegs and mackerel tubs, when painted green, do very well to plant house-plants in; and large cocoa-nut shells, cut in two and hung up with cords, make respectable hanging-baskets.

When the wick is too large for the lamp, pull out a few threads and it will go in.

The flavor of common molasses is much improved by boiling and skimming it before using.

Damp tea-leaves, scattered over a carpet before sweeping, improve the colors and gives it a clean, fresh look.

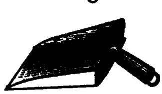


Fig. 2.—*Self-supporting dust-pan.*

When you want a dust-pan, have it made to order, with the handle turning down instead of up, so as to rest on the floor and tip the dust-pan at a proper angle for receiving the dust. It is a great convenience, as you then do not have to stoop and hold it while sweeping.

The patent carpet-hooks, sold by the hardware merchants, are greatly superior to tacks, saving a great deal of painful drudgery in putting down the carpet, and not requiring to be taken out and replaced every time the carpet is shaken.

Charcoal and honey, mixed together and used as a dentifrice, will whiten the teeth with a few applications.

Beef tea is best made by cutting up tender, juicy beef in bits about one inch square, and put it in a strong bottle, cork it tightly and set it in a kettle of cold water. Boil it about two hours. The fluid thus obtained will be the pure nutriment of the meat, and its tonic effects are powerful. Physicians have considered it better than alcoholic stimulants in cases of extreme exhaustion, where there is a feverish tendency in the patient.

CLOTHING.—If you have a small dress-pattern, cut the three front breadths considerably shorter than the others. There is no economy in making the dress narrower than usual. A yoke waist generally requires less cloth than any other, as it uses up all the small pieces.

Always shrink dress-braids before using, by putting them first in scalding, and afterwards in cold water. Even after shrinking, care must be taken not to pucker the dress in binding it, but put the braid on "full."

To support the weight of the skirts, wear an under-waist of bleached muslin, with five large buttons sewed at intervals near the lower edge. The waist should be rather low in the neck. Button-holes should be worked in the skirt-bindings to correspond with the buttons. Persons who have worn this garment several years pronounce it indispensable.

The wrinkles in a cloth cloak or other cloth garments are removed by hanging it in a warm place.

The following method is a good one for knitting a double heel:—When the heel is set, knit one stitch, take off the next stitch on the needle without knitting it; knit the next stitch, and you will find a loop of yarn on the inside of the heel, between the two knit stitches. Repeat the process to the end of the row. Coming back on the inside, you will knit the stitches that were left before, and leave those that were knit before, remembering to *seam* the knit stitches. Continue thus to the end of the heel. The loops on the under side make the heel double, and increase the durability of the stocking to a great degree.

When the nails in the soles of shoes project upwards and become troublesome, they should be pounded down and the shoes be fitted with a pair of kid insoles, pasted in with strong paste.

To preserve the smoothness and beauty of a muff, always carry it so that the ends of the fur point outward from the person.

A strip of the glazed fabric known as argentine, is neater, lighter and more durable than the oiled-silk commonly used for lining bonnets.

TO PROLONG FLOWERING.—In order to prolong the flowering season in perpetual and other roses, and in annual and perennial plants, clip off with a pair of scissors the seed-vessels, as soon as the petals fall. This prevents the exhaustion of the plant in the forming of seed, continues its vigor, and preserves a neater appearance of the whole plant. At the same time, the use of the scissors will enable the gardener to impart a symmetrical form to the plants.

RURAL AND DOMESTIC ECONOMY.

WRITTEN FOR THE ANNUAL REGISTER BY S. EDWARDS TODD.

HOW TO KEEP GRASS FROM GROWING IN WALKS.—When the soil has not been excavated, where the walk is made, to the depth of ten or twelve inches, and the excavation is not filled with stone, gravel, old mortar and other substances, the grass roots on each side of such walks will frequently run into the soil in the walk, and send up shoots so numerous that the walk will be quite green.

Make a weak brine and sprinkle the walks, by means of a water sprinkler, as often as the grass appears. A few pounds of salt used in this way will save a vast amount of hard hoeing, and, at the same time, keep such walks clean and neat.

Where there are quack roots, Canada thistle roots, or roots of any other noxious plants, it will be quite as well to sow the salt along the walks as it would to use brine.

SUGGESTIONS ABOUT CONDUCTING WATER.—It frequently happens that it would be very convenient to carry water, in a conductor-pipe or trough, from a well, across the highway to a watering trough, or to a mortar-bed, six or eight rods distant from the well. There are two ways in which conductors may be arranged to carry it very conveniently.

One way is, to set up four posts around the well and make a platform on the top of them, four, six or twelve feet high, and set the pump on the top. Then the water can easily be carried ten rods, or more, distant from the well, in small open troughs or conductors, made by nailing two boards together like an eave-trough. The conductor may be supported by small posts set in the ground, and may be out of the reach of cattle.

Another way is to set the pump on a platform, a few inches higher than the trough where the water will be received, and conduct it in water-tight pipe from the top of the platform down to the ground, and then, just below the surface of the ground to the place where it is to be discharged, when the pipe may be turned up so that the discharging end will be almost as high as the pump.

If the pump should be a forcing and lifting pump, one end of a pitman may be attached to the handle of the pump and the other end to a handle in a post, near the ground; then the pump could be worked without ascending the platform.

But if the pump were a chain pump, a small pulley with a groove in the periphery, may be put on the journal where the crank is, and a corresponding pulley on a journal set in a frame on the ground. Then a small chain belt, which may be obtained at most hardware stores for a few cents per foot, will drive the reel of the pump.

A wooden faucet, or a metalic one, such as are used in molasses barrels, may be inserted in the side of the pump-pipe or penstock, from which water may be drawn while the operator is standing on the ground. Such an arrangement of water fixtures will cost but little, and will sometimes save a great amount of labor.

TO MAKE A PIN STAY IN A GARMENT.—Sometimes it seems almost impossible to make a pin stay in one's clothes; and this is especially true when a garment has been made stiff with starch, like a shirt collar.

When pins are new and straight they will work out very readily; but let them be bent a little and they will "stay put." Let valuable shawl pins and collar pins be bent a little, making them full of kinks, and they will seldom work out of a garment. I never could make a pin stay in my cravat but a short time until I practiced bending them a little after they were put in.

MUFFLING THE CRACKS OF A DOOR IN WINTER.—Dress out some wooden rods, about half an inch or more square, and cover them with strips of woolen cloth. Strips of list wound around these sticks will subserve a good purpose; now close the door and nail the strips on the door, not on the casing, as it is usually done, close in the corners, on the sides and at the bottom and top. A door can can be made air-tight or wind-proof more perfectly by nailing the strips on the doors than to nail them on the casing, as it is usually done. When muffles are put on a door in this way a door will shut easily but very close and tight.

It would be a good improvement to fasten them on with small screws, as they could be more readily taken off in warm weather.

HOW TO USE A BROOM SKILLFULLY.—But very few people know how to handle a broom properly, although many are accustomed to sweep more or less every day of their lives. There is science in handling a broom as well as in many other kinds of manual labor. You may laugh at me, gentle reader, right in the face, at such thoughts as these, but we will show you that few people know how to sweep correctly.

Always draw your broom, by leaning the handle a little forward. And why? Because that position of a broom will take the dirt along more gently; it will sweep cleaner; it will not wear out a carpet and the broom so fast, and not half so much dust will be raised to fly all over furniture in a room.

Most sweepers thrust their broom forward of them, with the handle inclining towards them; and this position breaks the broom very much more than if it were inclined in the opposite direction; it flirts the dirt up from the floor, thus raising more dust; and it wears out a carpet or the paint on a floor much more than if it were drawn gently along in a sliding position.

TO TAKE A LOOSE CORK FROM A BOTTLE.—Bend a small wire in the form of the letter U, large enough to pass around the cork; then put the loop end of the wire into the bottle or jug, and turn it upside down, so the cork will

fall to the mouth of the jug, with the wire on each side of it and over the rear end, and it can be drawn out at once. The wire will be pressed into the sides of the cork as it is withdrawn. A small, strong cord will sometimes subserve the place of a wire.

When a bottle is full of any kind of fluid, so that the cork rises to the mouth, put in the wire and draw it up, and make it enter the hole straight, when it may be withdrawn.

Stenciling Letters on Portable Articles.—Every one ought to have his name stenciled on his bags, umbrellas, buffalo robes, and all such articles that are liable to be lost easily.

Mark out the letters or figures on a straight piece of tin, or sheet led or copper, and cut them through with sharp chisels by placing the tin on a smooth plank of hard wood. Prepare some thin paint, and lay the name on the article to be stencilled, and apply the paint by raising the brush up and down instead of drawing it back and forth.

The reason why names are blotted badly is because the paint is too thick or is put on too abundantly. There should be but a small quantity of paint in the brush in order to do it well, and the paint should be very thin.

To Stop Leakage around Chimneys.—Remove the shingles and fit them again close to the sides of the chimney; then mingle a lot of coal-tar and sand together, making a stiff paste; spread it neatly all around the chimney on the roof and press it down hard, and the water will be effectually excluded.

This plastic material will adhere to both the brick and the shingles; and neither frost, rains nor dry weather will cause it to peel off.

How to Cut Glass.—Let a pane or piece of glass be held between two pieces of soft wood board, planed smoothly and true, and hold it in a vise firmly; if the edges of the two boards are even with each other the glass may be broken off very true. The boards will prevent its cracking beyond their edges. Glass may sometimes be cut with a sharp corner of an old file almost as well as it can be cut with a diamond.

The Way to Paint Window Blinds.—There is a correct rule for painting window blinds, in order to do it neatly and quickly. In the first place, nail a strip of wood an inch or two in width across the end of a barrel; two barrels will make two benches for resting the blinds on. Place them just far enough apart so that the ends of the blinds will rest on the sticks on the ends of the barrels; lay the blind down flatly and paint along the inside of the stiles and the sides of the slats near the ends; turn the blind on one edge, and paint the *very ends* of the slats, and smooth off the inside of the stiles and bars; now paint the slats and the adjusting rod, and the last thing paint the stiles and bars.

When the paint on blinds is drying keep the slats open; and do not put so much paint into the sockets of the slats as to prevent their being folded

or adjusted easily. See directions for preparing paint and for painting, in Annual Register for 1864.

Fig. 1.—*A Putty Knife.*

How to Make a Putty Knife.—Take a piece of band iron about one-eighth of an inch thick and an inch and a half wide, and six or eight inches long, and cut off the corners on one end, as shown by the accompanying figure, and punch a hole in the other end to hang it up by; now grind the corners smoothly and true, and grind it flat on one side and bevel it on the other side like a chisel. After grinding it, scour it bright on a whetstone of very fine grit, or with scouring brick, so that it will slip well on the putty; if the surface is coarse, rough or rusty, the putty will not slip on it, and putty cannot be spread well with it.

I have one of this kind which I made in a few minutes, and it is far superior to any other kind of putty knife that I ever met with.

Ventilators for Grain in Bins.—Unless grain is very dry when it is stored in large bins, it is very liable to heat more or less and to become musty, which will injure it for market or for home consumption or for seed.

It is usually found to be very difficult to keep buckwheat in a bin during the warm weather of spring and summer, because it will heat and become mouldy.

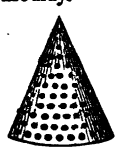


Fig. 2.—*Sheet Iron Ventilator for grain bins.*

In order to prevent grain from heating while it is in bins, saw a round hole about six inches in diameter in the bottom of the bin, and place a sheet iron ventilator, like the accompanying illustration, over the hole; then, by having small windows in the sides of the granary, there will be a complete circulation of air through the grain.

This kind of ventilators may be made of either tin or sheet iron, about eighteen inches long and six inches in diameter at the base, and made in the form of a cone, and the iron must be punched full of small holes, as in the engraving.

I have seen this kind of ventilators in use in the granary of Mr. W. A. J. Ozmun, South Lansing, Tompkins county, N. Y., and he assures me that they are a very useful contrivance.

In case a bin is a long one, the ventilators ought to be about four feet apart.

Improvement in Ventilators.—Let a hole be sawed through the floor in the bottom of the bin, about one foot square or more, and nail a piece of fine wire cloth over the hole. This will admit the air and hold the grain, and I cannot see why it will not be quite as good as the sheet iron ventilator just alluded to above.

Ventilators for Indian Corn Cribs.—Unless Indian corn is very ripe and dry when it is husked and put in the crib, and unless the crib is quite narrow and airy, Indian corn in the ear is very liable to be damaged more or less by

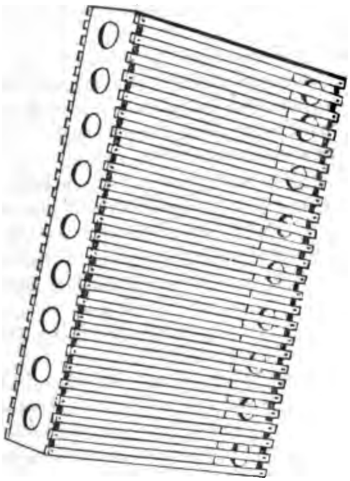


Fig. 3.—*Ventilator for Indian Corn in the Crib.*

heating; and when the cribs are made over the hog-sty or piggery the corn is very apt to be very much damaged by the aqueous vapor which rises from the pen beneath the corn, and which keeps it damp. Many good farmers contend that it is not at all practicable to keep Indian corn well in cribs over a piggery; but it can be done, as my own experience has fully proved.

The accompanying figure represents a ventilator that I was accustomed to use in my cribs when I was engaged in farming operations, which was placed lengthways of the crib over a long opening in the floor. It hardly needs any description. The end pieces are about six inches wide, three feet long, bored full of two-inch holes, and slats four feet long and three inches wide are nailed to them.

As soon as the crib is filled to the top of the ventilator, another one is placed on the top of it; in this way ventilators are added as the crib is filled with ears. The ventilators are not fastened to the floor, as the ears of corn will keep them in the place.

All the vapor from the piggery below, as well as from the middle of the crib, will rise through these flues and pass off into the atmosphere beneath the eaves of the building, as shown in the view of a combined piggery and corn-house, (p. 218,) which is a complete representation of the one now on the farm which I formerly owned in Tompkins county, which I built a short time previous to selling out there.

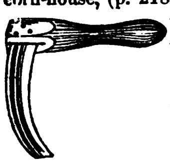


Fig. 4.

A Good and Cheap Corn Cutter.—Take a piece of a good old scythe and rivet it firmly in a gain in the end of a handle, as represented in fig. 4; and if the piece of scythe is good stuff, and the edge thin, it will make an excellent corn cutter.

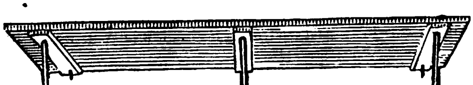


Fig. 5.—*Portable Staging for a Roof.*

Portable Staging for a Roof.—The accompanying figure represents a portable staging to be placed on the roof of a building when one is painting the roof. It consists of a


Fig. 6. Fig. 7.

plank with three cleats nailed across it, as shown in fig. 5, and legs with iron points in the ends of them to support one side of the plank, and an iron pointed spike passes through the other end of the cleat. The legs are made just long enough to hold the staging in a level position when it is on the roof. The pointed spikes keep it from sliding when a workman is on it.

A Burning Iron and an Eye Bolt.—Fig. 6 represents a burning iron, with a handle welded to the end of a larger piece of iron. Every farmer should have several of them, made of various sizes. They may be round or square; they should be hammered smooth, and then they will burn a smooth hole. A harrow tooth welded on the end of a half-inch rod will make a good one for burning the holes in a harrow for the teeth.

Fig. 7 represents an eye bolt, which is very convenient and useful when framing gates, harrows or anything else which is made with a mortise and tenon. After the tenon is *draw-bored*, such a bolt is driven into the pin hole to draw the work up to a close joint preparatory to pinning it together. The eye is made in it for the purpose of turning it back and forth when getting it out of the hole.

A CHEAP PIGGERY AND CORN-HOUSE.

Written for the Annual Register by S. Edwards Todd.

The accompanying illustration of a farm building, (p. 218,) is designed for a small farm, where only a few hundred bushels of Indian corn are raised, and where only a few swine are kept.

It is fourteen feet wide at the base, and about sixteen feet wide at the plates, and twenty feet long, and eight feet to the top of the plate. The frame is built in the balloon style, except that the studs at the lower ends are mortised into the sills; inch boards, six inches wide and sixteen feet long, are nailed on the studs for joists, which makes the upper floor come just to the lower side or bottom of the door, in the gable end of the building, which is hung on hinges to open upwards. A door of slats is made in the end of each crib, as shown in the end of the building; and the ears of corn can be shoveled directly into the cribs from the wagon, on to the main floor, or into the attic window.

The doorway is about eight feet wide, and the cribs three feet wide on the

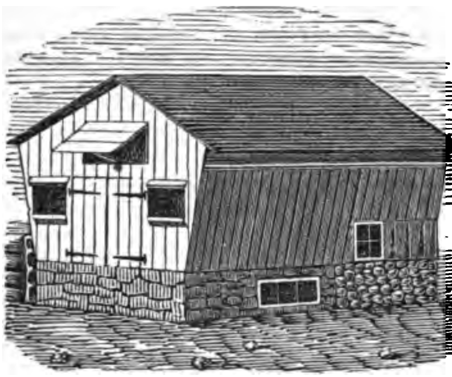


Fig. 1.—*A convenient and cheap piggery and corn-house for a small farm.*

bottom, and such ventilators as are described on page 216 were placed lengthways in the cribs.

The building was erected on a substantial stone wall, and in the rear of the building is a door to enter the feed room, which is six feet wide and fourteen feet long.

The apartment for the animals is about fourteen feet square, and the three-lighted window in the wall opens into the apartment of the swine, and the four-lighted one into the feed room.

On the opposite side of the building is a window into the feed room, and a door where the animals enter their sleeping and feeding apartment.

The apartment of the swine is four feet high in the clear, while in the feed room it is six feet in the clear; and there is sufficient room for swill barrels, meal-box, and a small furnace for cooking food if desirable.

The Partition and Trough.—A trough, made of plank, ten inches wide and four inches deep—which is sufficiently deep for holding all the swill that will be fed at one time—extends entirely across the pen, between the feed-room and the swine's apartment. The partition is made of a *flap-door* or kind of board gate, hung on hinges, directly over the trough, to a sleeper or beam over head. The bottom of the flap can play from one side of the trough to the other, and a wooden button holds it at either place.

When feed is put into the trough, the flap is fastened to that side of the trough near the swine; then as soon as their feed is arranged in the trough the flap is drawn to the other side of it and secured with a button, when the swine all come up to the trough.

At one end of the flap there is a small door where one could enter the apartment of the swine from the feed-room. Directly over the trough is a small door about two feet square, through which grain can be obtained from the floor of the corn-house.

The floor of the corn-house is twenty feet long; but a portion of it, six feet long, which is over the feed-room, is two feet higher than the other part, which is about twelve feet long and eight feet wide, which affords ample room for assorting corn or for thrashing it with a machine.

A few loose slats are placed against the studs on the inside as the cribs are being filled, and when it is desirable to get ears out of the crib the slats at the bottom of the crib are slipped a little endways with a crowbar, and the corn will slide out as fast as it is shoveled away, and no faster.

ORCHARD MANAGEMENT.

PRODUCTIVE ORCHARD.—A correspondent of the COUNTRY GENTLEMAN states that HENRY J. WIRT, of Orleans county, N. Y., obtained from two acres of orchard 1,000 bushels of apples, in the year 1863. Of these he sold $573 worth, put in his cellar 60 bushels of choice fruit, made 60 bushels into cider, dried 25 bushels and fed 30 bushels to his hogs. If the trees were two rods apart, or 40 to the acre, this crop would be an average of 12½ bushels per tree.

MARKET APPLES.—The same correspondent makes the following remarks on this subject:

"The apples most in demand for market are the Roxbury Russet and the largest and fairest red apples, such as the Baldwin, Esopus Spitzenburg, &c., for winter, and the Detroit Red and Twenty-ounce apple for fall market. For red apples, the demand seems to be governed by large size and fine showy appearance, rather than by quality. For instance, the Baldwins are mostly grown here on young thrifty trees, or on those recently grafted, and the fruit, though very large and fair, is generally rather coarse, and not very high flavored, and few farmers think of putting them up for their own use; yet there are few, if any kinds, that sell better or are as profitable to raise. This is also true in regard to the Detroit and Twenty-ounce. Every farmer has apples that are as good or better to use, that will not bring half the price of these showy kinds; yet they sell the highest of any apples here, many having been sold for from $2.50 to $3 a barrel the past season.

"The Roxbury Russet is in large demand for long keeping, making it a very safe apple to deal in, and bringing it into the retail market in the spring and fore part of the summer, when apples are scarce and high. It is much sought for, and probably one of the, if not *the* most profitable of all the apples grown here. It is also said that the Russets from Orleans keep better than those grown in any other part of the country. Greenings are largely grown, but generally do not bring so high a price as the kinds mentioned. For though a far better apple, they often have to be sold for from twenty-five to fifty cents a barrel less than the Baldwins."

PROFITABLE CROP OF APPLES.—The Genesee Farmer states than an orchardist in Western New-York sold from his trees 11,000 barrels of apples, mostly Baldwins, and that the whole amount of the sales was probably about

$15,000. If the trees averaged three barrels each, there must have been at least 100 acres of orchard, and there is no question that they received good attention and cultivation, and that the marketing was well managed.

Successful Apple Orchard.—A Connecticut correspondent of the Rural New Yorker states that he planted 150 apple trees in the spring of 1859. The ground has been occupied with hoed crops ever since—now five years. These crops suffered no diminution at first from the trees, but they are now beginning to shade them. The average circumference of the trees, two feet from the ground, is over a foot, and the diameter of the heads is six to twelve feet. Each succeeding year has given three times as many apples as the preceding one, and nearly the same increase is expected for some years to come. This is certainly very good success, and shows the superiority of good cultivation over neglect. An interesting fact is stated worthy of notice by all who desire to purchase big trees, viz., most of the trees were three years of age when set out, but those which were older and larger are not now equal to them in size. So much for the check in growth given by the removal of the larger trees.

Dried Apples.—Wm. H. Rogers of Williamson, Wayne county, N. Y., made 7,000 pounds of dried apples out of the crop of 1863, which he sold at ten cents per pound, making more money for that one article than is realized by many farmers for all their saleable products.

Pears for Family Use.—At the winter meeting of the Fruit Growers' Society at Rochester, twenty-one ballots were cast for the best fourteen varieties of pears for family use, with the following results, the figures designating the number of votes cast for each sort:

Bartlett	21	Belle Lucrative	16
Angouleme	18	Beurre Giffard	14
Louise Bonne	17	Beurre Anjou	14
Sheldon	17	Rostiezer	12
Lawrence	17	Flemish Beauty	12
Doyenne d'Ete	17	Winter Nelis	12
Seckel	16	Beurre Bosc	11

Winter Apples for Market.—At the same meeting the following votes were received for the six best varieties of market winter apples:

Rhode Island Greening	18	Northern Spy	6
Roxbury Russet	18	Golden Russett	7
Tompkins County King	18	Baldwin	14

Red Astrachan Apple.—A Massaahusetts correspondent of the Genesee Farmer says that by picking the Astrachan apples as soon as they get well colored, and placing them in a dry place, their propensity to rot is checked; they soon become mellow, and their acidity is so reduced that they are very agreeable in the hot season and never cloy the appetite.

Pears for Sandy Soils.—A cotemporary correctly mentions the Buffum and Flemish Beauty as well adapted to sandy soils. To these may be added Osband's Summer, Skinless, Beurre d'Amalis, Washington, Onondaga and Tyson.

LAYING OUT ORCHARDS.

Every one will admit that an orchard handsomely laid out in perfectly straight rows, is in every respect better than where the trees are in crooked lines. A cultivator can feel no pride in giving proper cultivation to an awkardly planted orchard; and trees standing out of line will be a constant annoyance to every plowman who is in the practice of laying perfectly even furrows.

Some planters take great pains in setting their trees, so that one tree at the end of the row will hide all the rest when the eye ranges through the line. But in securing this desirable object, a great deal of labor is often expended in sighting in different directions while setting each successive tree, so that every row may be straight every way. The following mode of laying out and planting will not require one-twentieth of the labor commonly devoted, may be performed under the direction of any common workman, and will give rows that will range perfectly, not only in both directions, but diagonally. The writer has found that two men would thus lay out from thirty to forty acres in a day, with perfect precision for planting.

The first thing to do is to procure as many short pins or stakes, a few inches long, as there are to be trees in the orchard. These may be made by simply splitting short blocks or boards with an axe, say half an inch in diameter. Then procure a strong cord as long as one side of the orchard, or, if the orchard is very large, as long as each section may be, if necessary to divide it. Then, with a pole or other measure, mark off the distances of the trees on this line, sticking a common brass pin through at each place for a tree, bending it around the cord so that it will not come out. Red yarn sewed through and tied around the cord would be more visible than pins; but the latter are quickly found if the workman measures the distance by pacing between them as he walks from one to the other. A new cord will stretch a little at first, but will soon cease to do so. The easiest way to mark the spaces on the cord is to wrap it lengthwise around a board cut at the right length, so that every third coil shall be a place for the pin. Thus, if the board is five feet long, by marking every third coil at the end of the board we obtain spaces of thirty feet. The field having been plowed and fitted for planting, we are now ready for operation. Select a still day, so that the wind will not blow the cord out of place, and then stretch the line along one side of the field, at a suitable distance from the fence where the first row is to be. Make it as straight as possible, by drawing on it forcibly; a stout cord being better than a feeble one on this account. If the land be tolerably level, and a strong cord be selected, thirty or forty rods may be measured off at a time. Place flat stones or other heavy weights upon it at intervals, to keep it in position; if there is some wind, some care will be

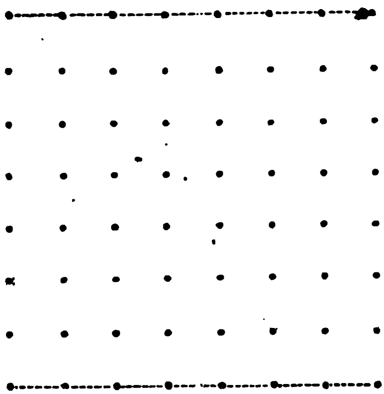


Fig. 1.

necessary in making it perfectly straight before thus fixing it. Next, drive in one of the short pegs or sticks at each point marked by the pin already described. When this is done, one row will be marked. Then remove the line, and mark each end of the field at right angles to this in the same way. Lastly, mark the remaining side. Before marking both ends, it is safest to stretch the line on the fourth side, that all may be accurately spaced. Next, to fill up this hollow square with the proper marks, stretch the line successively between corresponding sticks on the opposite sides, and mark as before till the whole is completed. If the work has been carefully done, every stake will range perfectly. Every cord will stretch more or less, but if stretched so that the ends shall come out even each time, which is attended with no difficulty, the rows will be perfect, as shown in fig. 1.

Next take a strip of board, say about eight feet long and six inches wide, as shown in fig. 2, and cut a notch in one side at the middle, just large enough to let in the stem of a tree. Bore a hole through each end, exactly at equal distances from this notch. Then, whenever a tree is to be planted, place the middle notch around the peg, and thrust two other pegs through the holes at the ends. Then take up the board, leaving these two pegs, dig the hole, replace the board, and set the tree in the notch. Proceed in this way till the whole orchard is planted. It is obvious that the trees will stand precisely where the first pegs were placed, and will range in perfect rows. A large number or series of the two pins may be set successively by the board, so that a number of workmen may be digging and planting at the same time. It is of no importance in what direction the board is placed, as the pin and the tree will occupy the same spot as shown in fig. 3, the row extending from *a* to *b*.

Fig. 2.

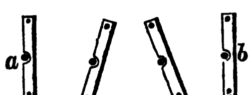


Fig. 3.

PACKING APPLES IN BARRELS.

Where fruit is sold by the quantity, barrels are always best for packing, as well for cheapness and strength as for the ease with which they may be moved without jolting. Apples will keep best if exposed in heaps two or three weeks to open air before barreling—as some of the exterior moisture escapes, and they become less liable to decay. The few minutes additional time required to deposit them carefully and without dropping them into the barrels, will be many times repaid by the fine condition in which the consumer finds them. There should always be at least two barrels placed side by side when filling; one should be marked "extra," and as the assorting proceeds should receive none but the finest specimens; the other only such as are decidedly good; all the rest, including those that are bruised, scabby or marked with insects, should be rejected for distant market, and used only for home purposes, such as stewing, converting into cider, or feeding to domestic animals. In well managed orchards, where pruning or thinning the branches, thinning the fruit, and proper cultivation have been attended to, this third or inferior portion will constitute but a very small part; in other orchards, grown up with suckers, weeds and grass, and with tops consisting of brush and stunted branches, the labor of selection will be small, for the whole crop will be of this third portion.

Apples should be so snugly placed in the barrels that there can be no rattling when they are moved. They should, therefore, be slightly shaken several times while filling. A little practice will enable any one to do this sufficiently without danger of bruising. The upper stratum should be made as straight and uniform as practicable, and at such a height that the head of the barrel will slightly indent them—the dry wood absorbing the moisture and preventing decay.

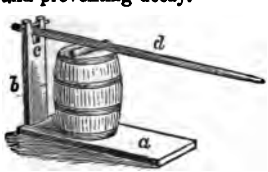


Fig. 1.

A simple contrivance is adopted by packers for placing the head in position, and is shown in the annexed sketch. It consists of a plank, *a*, on which the barrel stands, into one end of which is dovetailed an upright piece of plank, *b*, a little higher than the top of the barrel. A slot, *c*, is cut in its upper end, and a pin runs across to receive the end of the lever, *d*, which may be six or eight feet long. A round board is used as a follower, to be placed upon the head; and across this board is placed a cylindrical piece of wood about three inches in diameter, (and flat on the lower side,) on which the lever is placed. A moderate pressure at the end of the lever, and a little practice in its use, will enable the operator to bring the head to its position with great ease, precision and accuracy.

TRAINING GRAPES TO LAY DOWN IN WINTER.

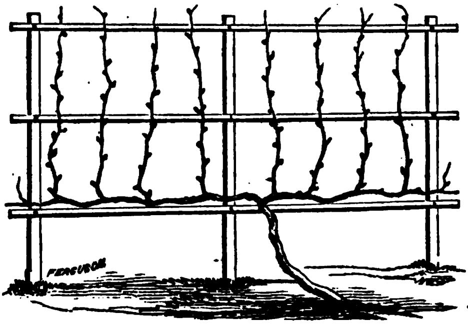


Fig. 1.

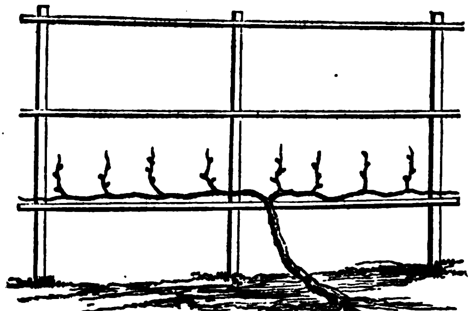


Fig. 2.

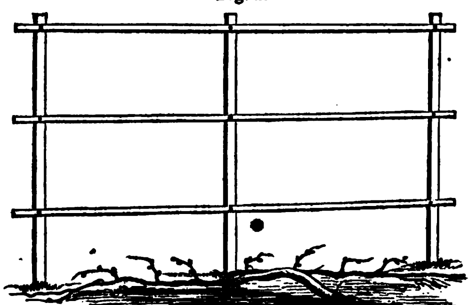


Fig. 3.

S. Worden, of Oswego county, N. Y., gives his plan, (in the Country Gentleman,) as follows:

The winters are growing so very cold, it has become necessary to lay down our grapevines in order to secure a crop. I will give you my plan to get more sun fore and after part of the day. My trellis runs east and west. I set my vines about 18 inches back of the trellis—the vine is brought under and tied to the lower slat; this brings it about a quarter pitch. By so doing they can be laid down and raised up when very large, without injury. They must be trained with "arms" and upright canes, fig. 1. Fig. 2 represents the vine pruned to lay down. Fig. 3 represents the vine laid down to cover for winter. You will see the vine lays flat on the ground The work can be easily done. Light dry soil, muck, leaves or old rotten manure,

is good. If covered with wet, heavy soil, it soaks and injures the buds. By covering in winter they will ripen one week earlier, which is of much importance as far north as Oswego.

WANT OF CALCULATION.

A cotemporary states that a large farmer at the West, sold last fall, twenty tons of hay at six dollars per ton; and again, in January, twenty tons more at ten dollars per ton, and thought that he was making his fortune. In the spring, however, he was compelled to go long distances to buy hay at twenty dollars a ton, giving his note, to save his stock from starvation.

Such occurrences as this show the common want of calculation among farmers in providing winter food for their stock. Every man who has kept cattle and horses as long as three years, ought to know the average amount they will consume per head each winter. The amount will, of course, vary with the season—a long and cold winter requiring more than a mild one. If the animals are exposed to the weather and wintery winds, the difference will be very considerable, say twenty-five or thirty per cent; if they are well sheltered it will be quite small, say not more than ten per cent. The farmer must make his calculations accordingly, and be sure to have enough for any contingency, for it will not be profitable for him to keep them well through three-fourths of the winter, and then starve them to death at last. The amount required per head will also vary with the latitude, as well as with the size of the animals, and the general economy in management. Perhaps it may be taken as an average in the Northern States, that a horse will consume three tons of good hay, and a cow two tons, where good care is given, and a moderate amount of roots, meal and other food. It is important that farmers should inform themselves well on this point, in doing which, approximate results may be easily obtained, by occasionally weighing the food given them during a week.

Every farmer should know the amount of hay he has secured during the summer. A weighing scale for this purpose (which may be also used for weighing fattening animals,) would soon pay for itself, by enabling the owner to determine his whereabouts accurately; but, in the absence of such a scale, the occasional weighing of a load will soon enable him to guess the amount not very far from the mark. Every load drawn into the barn or stack should be entered in his memorandum book, and he will thus be enabled to know, with tolerable accuracy, how much he has on hand, and how many animals it will safely carry through the winter. He can then lessen or increase his stock accordingly in good season, without waiting till he has reached the last extremity.

Those who have kept no such account may nearly determine the amount on hand by measuring. Hay, cut early, when the stalks are soft and flexible, will settle closer than such as is cut when nearly ripe, or when the stalks are stiff and dry. But, as an average, good timothy hay in a mow or stack, will yield a ton for every five hundred cubic feet—the top, of course, will be lighter, and the bottom heavier, but this will be the average. Clover hay will be nearly one-half lighter, that is it will require some seven hundred feet to the ton. A little practice in this way, with hay which he has weighed, will enable the farmer to judge nearly the amount of hay he has stored. And this knowledge, applied as already stated, will not only enable him to meet his calculations with accuracy and economy, but will save him from much uneasiness and anxiety occasioned by the fear of starving his animals.

TRIMMING HEDGES.

There has been some discussion, of late years, on the expense and best mode of trimming Osage Orange Hedges, and some have regarded it a formidable item of expense. We have made some experiments and observations on this subject, and give our readers the following results:

Trimming with a stiff scythe is a rapid mode, but as the operator has to strike upwards in order to do the work smoothly, and to prevent breaking and splitting the branches, it is hard and severe work on the wrist. In most of the experiments alluded to, a common corn-cutter has been employed, which has a wooden handle about a foot and a half long, in which a steel blade is set obliquely and about twelve inches long, (fig. 1.) With this simple instrument one man has trimmed one-half to three-fourths of a mile of four-year hedge on both sides in a day—cutting it to a peak in the middle, like the roof of a house. A great improvement would be made in this tool by making the handle three and a half feet long, and setting the blade more nearly in a line with it, as shown in fig. 2. The blade of an old scythe, cut short, might be worked over by a blacksmith, so as to answer the purpose well. This length of handle enables the operator to strike more efficient blows, and keep his hands clear of the thorns. The workman we have employed is satisfied he could easily trim a mile or more in a day with such a tool. When the hedge becomes older and higher, the labor probably would be somewhat increased; but two annual trimmings would not probably cost more than one cent a rod.

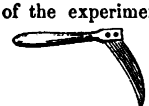


Fig. 1.

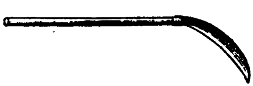
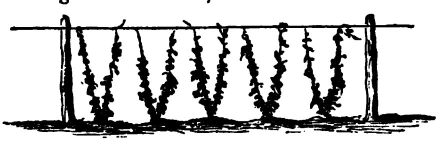


Fig. 2.

TRAINING LIMA BEANS.

H. P. B. gives the following directions:—"I set two rows of posts four feet apart, and eight or ten feet apart in the rows; the posts six feet high above ground. These may be made of good chestnut rails, hewed to three inches square at the top. Twelve inches above the ground along the line of these posts, I nail a strip three inches wide, and another at the top of the posts, of less width. Across, on the top of the posts, is nailed another strip to keep the posts firm; another strip forms a ridge-pole, supported by small rafters, set at an angle of forty-five degrees, from the top of the posts. To the lower strips is tied cord, sixteen inches apart; each cord is taken around the upper slat, and over the ridge, and secured on the opposite side in the same manner. It is designed to have but one plant to a cord. In this method of planting, more plants can stand on the same ground, and still so divided as to be open to the air and light, and the result is a product nearly or quite double that which can be grown upon poles. If the frame is well set up it will last many years. It may be so made that it can be removed to different locations. When the posts are set on each side of a garden walk, a very neat, shady avenue is formed, with economy of room. This plan is not confined to Lima beans, but it is equally adapted to all the running varieties."

W. A. Underhill, of Croton Point, North river, has adopted a mode of training the Lima beam, which is exhibited in the accompanying figure, and which he thinks possesses some important advantages over the common mode of training on poles. A strong wire is stretched from the tops of posts placed at a distance from each other; and to this wire two diverging cords from each hill of beans are attached. This mode gives more complete exposure to air and sun, affords larger crops, and has a neater and more finished appearance than the usual way of training.



Garden Walks.—There is no part of gardens or pleasure grounds more expressive of the character of the keeping than the walks. No matter how fine the flower beds may be, if the walks are not bounded by smooth and graceful curves, or if they are rough, irregular and unfinished, the grounds will convey unmistakably an expression of bad management. But a smooth and perfect walk on the other hand, even if carried through a wild natural shrubbery, imparts a finished air to the whole. These facts should be borne in mind by all owners of ornamental gardens.

NEAT PREMISES.

A great difference may be observed in good farmers, so far as keeping their premises in neat and finished order is concerned. With some, no weeds, briars or bushes are seen along fences, no gates off their hinges, and no tools out of place or exposed to the weather. Others, successful in most particulars, are careless in these and similar respects. This is doubtless partly owing to the force of habit, partly from a slovenly mind, and partly by undertaking more than they can well accomplish. As a general rule, the neat farmer is the most successful one—this we have observed in a large number of instances, and the exception is probably not one in twenty. The reason of this is that the man of order and energy, qualities required for the best success, carries out his ideas of order in all their details, and does not do a smart thing in one place and a stupid thing in another.

It, however, sometimes happens that order and neatness are neglected because everything is not thought of at the right time. To obviate this difficulty, every owner or manager of a farm should carry a small memorandum book in his left pantaloons pocket, where it will always be at hand whether he throws his coat off or not. Wherever he passes he will, of course, have both eyes open, and everything which he sees out of order or requiring attention, which he cannot instantly rectify, he should at once enter in his book—such, for instance, as a broken gate, latch, a board knocked off the fence, a harrow left in the field, a batch of thistles left uncut, a burdock and a bunch of elders growing in a corner of the fence, a wagon with a defective linch-pin, a weakened strap in his harness, and a hundred other matters of a similar character. The first day that can be spared either by himself or one of his best workmen, should be devoted to putting these things all in order with the memorandum book or a copy of it before him, where everything is crossed out as fast as they are completed.

By adopting this course as a regular system, the whole premises would soon be found to have assumed a neat and satisfactory appearance, and, as a matter of economy, no labor will probably be so well expended.

HEDGES FOR THE SHADE.—A friend inquires what the best hedge plants are to grow in the shade of trees. Nothing is better than the hemlock or the Norway spruce. Any one can readily determine before hand what plants will succeed best, by examining the interior of thickly growing bushes. If, on turning up the branches, the leaves are found dense and healthy inside, such trees will grow well in the shade; but if the inside leaves are dead, or the shoots bare of foliage, they will not succeed. A buckthorn hedge, for example, is found to have all the leaves outside, and none at all toward the centre; as a necessary consequence, the buckthorn is one of the worst of all hedges under the shade of trees.

POULTRY KEEPING AND RAISING.

The following plan of a Poultry House was furnished for the COUNTRY GENTLEMAN by Mr. C. E. SANDS of Duchess county:

The first and most important step in the successful raising of poultry, is the situation and building of their abode, and there are four principles to be borne in mind in the erection—light, warmth, ventilation and cleanliness—and in order to illustrate these requisites the more fully, it is proposed in the present article to give merely the plans of the hennery on the writer's premises, reserving for some future time the most preferable breeds, mode of feeding, rearing of young, &c.

FIG. 1.—*Poultry House.*

Entire originality cannot be claimed in the construction of the house, but the plans are the result of observation and ideas suggested in your paper from time to time, and although somewhat resembling the external appearance of fig. 23, page 74, vol. 3 of the ANNUAL REGISTER OF RURAL AFFAIRS, I cannot yield to it the palm of the model poultry house.

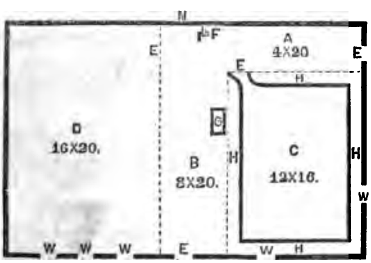


FIG. 2—*Ground Plan.*

A spot as convenient as possible to my dwelling was selected as a site for the building, for the nearer the poultry house is to the habitation of man, the fewer will be the attacks of birds of prey or any destructive animals. The foundation was dug in a side-hill, with the north and west walls banked up to within two feet of the eaves, leaving the south and east fronts entirely open. This was done in order to break the cold wintery winds.

The building is of brick, 36 feet by 20 feet inside, the walls being 8 inches thick, 9 feet high. There are windows in each gable; also three windows 5 feet by 3 feet, separated by brick piers, in the the roosting appartment; two windows in the laying room and also the door in the south front is half sash,

affording an abundance of light and air. There is also a ventilator in the roof over the roosting apartment, with a strap so arranged that by means of a cord and pully it can be raised or lowered at pleasure. There are two doors, one on the south, opening into the yard; the other on the east side, and as an entrance into the building. Three openings for the fowls—two into the roosting room, and one opening into the laying room, complete the exterior of the building.

There is a cistern 5 feet square on the north side, that discharges itself by means of a faucet in the building, thereby dispensing with the necessity of a pump.

The interior will be more readily understood by a glance at the ground plan. A., passage way; B., room for preparing warm food in the winter; C., nest room; D., roosting room, with the usual ladder-like perches; E., doors; F., cistern faucet; G., chimney, into which is inserted the pipe of a small farmers' boiler, holding about 15 gallons; H., shelves for nest boxes; W., windows.

The walls inside are plastered and finished with lime and white sand, thus adding to the warmth of the building, and presenting a smooth surface for whitewashing.

The floor was first paved with brickbats, and grouted, and then floated off with a thick coat of cement, rendering it entirely rat-proof, and easy to remove the droppings. The floor above extends over the rooms C. and B., and is about 20 feet square, and is used for feed bins, (of which there are three,) and for storing coops, nest-boxes, &c., when not in use. The loft is gained by means of a ladder through a trap-door over the room B., thus doing away with the necessity of a stairway; the ladder when in disuse may be hung on hooks screwed into the partition.

The grain is hauled up by means of a tackle, and discharged below through shoots as required.

The partitions between the different apartments are made of slats, 1 inch thick, 2½ inches wide, and set 3 inches apart. This arrangement allows a free circulation of air, and also the heat from the stove in winter, to equalize the temperature.

The last, though not the least requisite, is the proper arrangement of the nest-boxes. Upon this part of the establishment I have paid more attention than to any other, and after trials of many of the plans advocated have adopted the present one. There are two shelves running each side of the room, the first about 12 inches from the floor, and the other about 18 inches above it; the shelves rest upon brackets which project about 5 inches beyond the shelves, upon which is fastened a bar for the hens to hop up on before going into the nests.

The boxes are made of siding 16 inches by 14 inches, planed inside and out, without any bottom, the shelf forming a bottom, thus rendering it easy

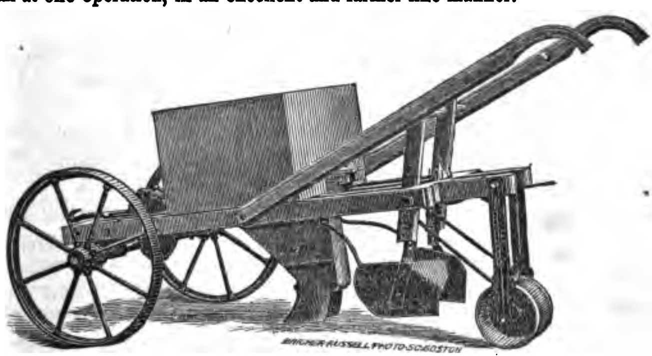
to cleanse after three weeks' occupation. In order to give an idea of security to the nests, I have nailed laths between the shelves and fastened small hemlock branches between them.

There is a yard attached to the building, 36 by 80 feet, boarded close from the ground about 3 feet, in order to keep off cold winds. There is also in it a shed about 75 feet long, and 6 feet in height, under which the fowls congregate in stormy weather.

TRUE'S POTATO PLANTER.

S. E. Todd, who has superintended the trial of a working model of this machine, gives the following account of its working:

It performs the labor of making its own mark or furrow for receiving the potatoes; cutting them; dropping them; covering them, and rolling them, all at one operation, in an excellent and farmer-like manner.



The accompanying illustration will furnish a correct idea of this implement. One horse will work it with great ease. Two drive wheels in front support the machine and work the cutting and dropping apparatus, and cause the implement to run very steadily. Any boy who is strong enough to handle a cultivator, can work this implement without any difficulty.

The potatoes are put into the hopper, and enough for a hill is cut and dropped with great accuracy, and covered as well as the labor could be done by hand, and as fast as a horse can walk.

In addition to these things, the machine is neatly and substantially made, and must prove a great labor-saving implement in those localities where large crops of potatoes are raised either for market or for home consumption.

SUPPORTS FOR LIGHTNING RODS.

Former numbers of the REGISTER have given full directions for erecting lightning rods. But frequent inquiry is made for particular directions how to fasten them to the building.

Wooden supports are far better than anything else, for several reasons. They are cheaper, more easily secured, will not direct the fluid into the building, as iron, and may be made longer, so as to keep the rod farther from the building. The upper support on a chimney may be a light, square wooden frame, *a*, fig. 1, nailed together, and accurately fitting the chimney outside, one of the rods forming the frame projecting a foot, through which a hole is bored to receive the rod. A carpenter will make such a frame in half an hour. At the foot of the chimney a piece of plank, with a hole through the upper edge, as shown in fig. 2, is nailed on the roof, so as to keep the rod about six inches from it. One or more like this may be placed between the chimney and the eaves, to keep the rod above the roof. At the eaves a very simple fastening is made, consisting merely of a piece of board with a hole through the outer end, nailed on the roof, or still better beneath the eaves, and projecting a few inches. Should any support at the side of the building be required, it may be made as shown in fig. 3.

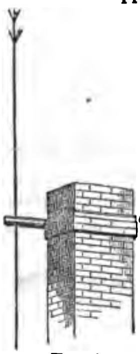


FIG. 1.

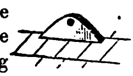


FIG. 2.

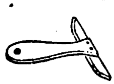


FIG. 3.

Any blacksmith can make the rod, by simply welding rods together, when it may be easily dragged home behind a wagon; and a carpenter, or even any common farmer of ordinary ingenuity, will make the supports. If the upper end has several points, the lower end of the rod should be first passed through the supports before they are fastened to the building.

Copper is a better conductor than iron, in about the same ratio as its increased cost—iron is best and stiffest on the whole, except beneath the earth, where copper is better by not corroding away. Several points, by dividing the discharge, should there ever be any, would be less liable to melt, as has sometimes happened with a single point. Iron points, ground sharp like a needle, and polished, will remain sharp for ages, for no water to corrode can remain upon them. Or they may be tipped with copper.

A common cause of failure is the shallow depth of the rod at bottom. It should never be less than 5 or 6 feet into the earth, and should have a bushel of charcoal there to dissipate the fluid.

RAISING YOUNG TIMBER.

The rapid and almost entire disappearance of the original forests of the several States, and the great increase in the price of timber, indicate the importance to every considerable land-owner, of allotting a portion of his farm to the growth of new timber. The following rules should be observed:

1. Where old woods are cut down the new growth will spring up the best by making a thorough clearing as far as any of the trees are cut.

2. The young and dense growth which now springs up will afford much more and better timber by being properly thinned out and trimmed every few years—the part thus cut out proving a valuable crop each time.

3. Different rules have been given as to the distances of thinning; but the more common opinion is that young trees should not be allowed to stand nearer together than one-third of their height. The thriftiest and straightest trees should always be left, and the distances asunder be nearly uniform. The superiority of timber-land thus treated, both in the amount and quality of the timber, over such as is entirely neglected, would be surprising to any who had never before witnessed it.

4. The most profitable period or age for cutting, as indicated by ample experience, is about twenty years; a less average yearly return will be obtained if shorter or longer periods are selected. Well managed timber land on medium soils will produce at this age about 20 cords per acre, or one cord per acre annually. A farmer therefore may obtain a supply of fuel equal to 20 cords yearly from 20 acres of woodland; or an equal amount of more valuable timber.

5. A larger amount and more valuable returns might be obtained from land specially planted in the first instance with the most valuable kinds of trees. They might be planted in the first place on cultivated soil, in alternating or occasional rows with corn, or other drilled crops. The cultivation given would cause a rapid growth while the trees are young; the thinning might be more systematically and perfectly performed; wagons could pass with perfect facility for drawing off the timber between the straight rows; and the rows, when once established, would remain perpetually, the trees sprouting up from the stumps at each cutting.

Harvesting Roots.—In harvesting Turnips, Carrots, &c., a great deal of time may be saved by cutting off the tops before they are removed from the soil, by means of a small, light hoe, ground as sharp as a knife. Turnips are most quickly removed by a two-pronged tool in form of a hoe, placed under them. If Carrots have been planted in straight drills, plowing a deep, even furrow close to and away from the row, will facilitate the work.

LAYING TILE IN DRAINS.

There are three kinds of material forming the bottom of drains, requiring different treatment in selecting and laying the tile. The first, where the bottom is slaty or smooth rock, the horse-shoe tile, without any shoe, may be used freely and safely, as it can never sink or become choked. In hardpan or compact earth the horse-shoe may settle in the lapse of years, and hence is objectionable. The bottom of such drains should be cut and smoothed off with a round scoop, so as nearly to fit the tubular tile to be laid in it. If the soil is quite hard, and rather clayey, a little straw is all the covering that is necessary before throwing in the earth. If softer and more sandy, a small flat stone or two inclined flat stones, should be laid on each joint. These will not only serve as a covering, but will tend to prevent the pieces from settling out of line. Broken fragments of larger tile, by fitting more accurately, are better than flat stones. If the soil be quite sandy, and especially of the nature of quicksand, it it will be absolutely necessary to procure short tubular collars, into which the two joining ends of the pipe tile may be thrust. These collars will not only serve as a cover, but form a perfect security against any displacement by settling.

TYING MATERIALS FOR FARMERS.

There are two materials used for the various purposes of binding and tying which every farmer should be supplied with. One of these used for gardening purposes, tying up trees and plants, ligatures for budding, &c., is the prepared basswood bark. This is very easily manufactured, and may be procured in abundance wherever basswood is used for timber or saw logs. Remove the bark when it will peel freely, and place it under water immediately, before it dries any whatever. A moderately running stream is best, as it carries off the foul odor otherwise arising. It is best to place it in masses or beds, and sink it by means of stones. In ten days or so the inner or smooth bark will peel off handsomely in stout ribbons, and should be hung up to dry. The remaining bark may be sunk again, and in a fortnight will afford another and coarser peeling.

The other material, valuable for binding cornstalks, corn shocks, thrashed straw, and other purposes where strength is needed, is the ozier, such as nurserymen employ for packing trees. There are different oziers, some too brittle for this purpose—the stronger sort, *Salix purpurea*, is nearly as stout and flexible as hemp cords, and as much will grow on a square rod for binding purposes as may be obtained from an acre of rye straw. It should be cut down every spring to the ground, and the young shoots which numerously spring up constitute the tying material.

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ILLUSTRATIONS.

THE CULTIVATOR ALMANAC, FOR 1866.

ASTRONOMICAL CALCULATIONS IN EQUAL OR CLOCK TIME.

ECLIPSES FOR THE YEAR 1866.

I. A partial eclipse of the Sun March 16th. Invisible in the United States. Visible in Siberia, Behrings Straits, and the north Polar region.

II. A total eclipse of the Moon in the evening of March 30th and morning of March 31st. Visible throughout the American continent—beginning at New-York at 9.41 P. M., March 30, and ending 1.33 A. M., March 31. Size of eclipse, 17.04 digits.

III. A partial eclipse of the Sun April 15th. Invisible in America, but visible in the Indian Ocean and southern Australia.

IV. A total eclipse of the Moon September 24th, early in the morning. Invisible in the United States except along its western boundary. Size, 19.404 digits. At San Francisco it begins at 4 o'clock 9m. morning. It becomes total at 5h. 9m. Middle of total eclipse at 5h. 57m. The moon sets totally eclipsed about sunrise.

V. A partial eclipse of the Sun October 8th, in the morning, at the time of new moon. This will be visible in British America and New-England, and in New-York state except its south-western portion, but its size will be very small. Its southern limit of visibility will be a line running from the straits of Mackinaw to Toronto, Owego, Port Jarvis and Fire Island. Along this line the eclipse will be a mere contact of limbs, and in New England it will be from ½ to ⅞ of a digit in size. At Boston it begins at 11h. 19m. morning, and ends at 0h. 22m. P. M. At Porttand it begins at 11h. 17m., and ends at 0h. 27m. At Quebec it begins at 11h. 3m.- and ends at 0h. 23m. P. M.

MORNING AND EVENING STARS.

VENUS.—Venus will be morning star until February 25th, then evening star until December 11th, at which time it passes the inferior conjunction with the Sun, and becomes invisible. Just before this time it exhibits a long slender crescent, always *convex* towards the Sun, its horns being turned back, and towards the east; but when seen again, it appears in the east before sunrise, with its long crescent bowing back towards the west. On the 5th of November it will be brightest, being then about 40° east of the Sun.

MARS.—Mars will be morning star until October 8th, when it is 90° west of the Sun; then evening star the rest of the year. On the 2d of December it begins to retrograde, or move westward past the stars. It will be in the southern signs until May 7th, when it passes the equator northward. On the 28th of March it will be about 10° south of the central stars in the Urn; on the 20th of July it will be 5° south of the "Seven Stars;" on the 6th of August it will be 5° north of Aldebaran; on the 29th of August it will be 2° north of ζ Tauri; September 14th it will be between and 1° north of

η and μ Geminorum; October 18th it will be 9¼° south of Castor, and on the 25th, 5° 37' south of Pollux. When a planet is *north* or *south* of a star, a straight line drawn from the North Star runs *through both*, whether they be in the meridian or not.

JUPITER.—Jupiter will be morning star until April 21st, when it is 90° west of the Sun; then evening star the rest of the year. It is in the southern signs yet, but is moving northward.

SATURN.—Saturn will be morning star until January 31st, being then 90° west of the Sun; evening star until November 7th, when it is in conjuction with the Sun, and invisible; then morning star the rest of the year. It will be in Libra this year.

MERCURY.—Mercury will be visible in the west soon after sunset, about March 23d, July 20th, and November 15; also in the east just before sunrise, about January 16th, May 14th, September 9th, and December 30th, being at those times at its greatest brilliancy.

EQUINOXES AND SOLSTICES.

	D.	H. M.			D.	H. M.
Vernal Equinox, March	20	2 46 eve.	Autumnal Equinox, Sept.		23	1 43 mo.
Summer Solstice, June	21	11 26 mo.	Winter Solstice,	Dec.	21	7 42 eve.

THE CYCLES, ETC.

The year 1866 is the second after leap-year, and the latter part of the 90th, and beginning of the 91st year of American Independence: the 6,579 of the Julian Period; the 5,626–7th of the Jewish era; the 2,619th of Rome; the 2,642d of the Olympiads; the 2,178th of the Seleucidæ; the 1,283d of Mohammed, which begins May 16th. The Jewish year 5,627 begins September 10. Dominical Letter, G; Epact, 14; Golden Number, 5; Solar Cycle, 27; Roman Indiction, 9; Dionysian Period, 195.

SHOOTING STARS.

Of shooting stars, there is an average of from five to seven visible every hour on a clear night. They are stray visitants in contradistinction to the prodigious swarms of November and August, which observation during 25 years has decided to be accurately returning phenomena. They are much more numerous during the latter half of the year, when the earth is passing from summer to winter, from aphelion to perihelion. The same increase of number in the last six months of the year is observable in the appearance of fire-balls and ærolites. Now by what theory can we account for this uniform return of meteors in each year? The theory generally accepted is, that there is a ring or annulus of small bodies revolving with planetary velocity about the sun; that the bodies in question are distributed very unevenly in the ring, there being a small section of the ring where the bodies are numerous, with a few stragglers scattered along the rest of its circuit; that the earth passes through the ring every year, and each year in a new place; and that it passes through that part of the ring in which the planets are most numerous once in about 33 years. We have reason to expect a shower in 1866, since the cycle of 32.25 years is probably to be reckoned from some date between November in 1832 and in 1833.

1st MONTH. **JANUARY, 1866.** **31 DAYS.**

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
Full Moon,	1	2 4 mo.	1 54 mo.	1 40 mo.	1	12 3 58
Third Quarter,	8	4 18 ev.	4 6 ev.	3 54 ev.	9	12 7 31
New Moon,	16	3 52 ev.	3 41 ev.	3 29 ev.	17	12 10 29
First Quarter,	23	4 10 ev.	3 58 ev.	3 46 ev.	25	12 12 42
Full Moon,	30	3 44 ev.	3 32 ev.	3 20 ev.		

Day of Month.	Day of Week.	Sun's declens. S.	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets.	MOON sets.
		° ' "	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	M	22 59 11	7 30	4 38	rises.	11 32	7 25	4 43	rises.	8 18	7 19	4 49	rises.
2	T	22 53 51	7 30	4 39	6 41	ev.23	7 25	4 44	6 44	9 9	7 19	4 50	6 47
3	W	22 48 3	7 30	4 40	7 44	1 10	7 25	4 45	7 46	9 56	7 19	4 51	7 49
4	T	22 41 49	7 30	4 41	8 46	1 52	7 25	4 46	8 47	10 38	7 19	4 52	8 49
5	F	22 35 6	7 30	4 42	9 44	2 32	7 25	4 47	9 45	11 18	7 19	4 52	9 46
6	S	22 27 58	7 29	4 43	10 43	3 16	7 25	4 48	10 43	ev. 2	7 19	4 53	10 43
7	G	22 20 22	7 29	4 44	11 40	4 1	7 25	4 49	11 39	0 47	7 19	4 54	11 38
8	M	22 12 20	7 29	4 45	morn	4 48	7 24	4 50	morn	1 34	7 19	4 55	morn
9	T	22 3 52	7 29	4 46	0 38	5 38	7 24	4 51	0 36	2 24	7 19	4 56	0 34
10	W	21 54 59	7 29	4 47	1 34	6 30	7 24	4 52	1 31	3 16	7 19	4 57	1 29
11	T	21 45 39	7 29	4 48	2 30	7 24	7 24	4 53	2 27	4 10	7 19	4 58	2 24
12	F	21 35 54	7 28	4 50	3 26	8 18	7 23	4 54	3 22	5 4	7 18	4 59	3 18
13	S	21 25 44	7 28	4 51	4 20	9 11	7 23	4 55	4 16	5 57	7 18	5 0	4 12
14	G	21 15 9	7 28	4 52	5 14	10 3	7 23	4 56	5 10	6 49	7 18	5 1	5 6
15	M	21 4 10	7 27	4 53	6 3	10 51	7 22	4 57	5 59	7 39	7 18	5 2	5 55
16	T	20 52 47	7 27	4 54	sets.	11 33	7 22	4 59	sets.	8 19	7 17	5 3	sets.
17	W	20 41 0	7 26	4 55	6 16	morn	7 21	5 0	6 18	9 6	7 17	5 5	6 21
18	T	20 28 49	7 26	4 56	7 22	0 20	7 21	5 1	7 24	9 51	7 16	5 6	7 26
19	F	20 16 15	7 25	4 58	8 29	1 5	7 21	5 2	8 30	10 34	7 16	5 7	8 31
20	S	20 3 18	7 24	4 59	9 36	1 48	7 20	5 3	9 36	11 18	7 15	5 8	9 37
21	G	19 49 59	7 24	5 0	10 44	2 32	7 19	5 4	10 43	morn	7 15	5 9	10 42
22	M	19 36 18	7 23	5 1	11 52	3 22	7 18	5 5	11 50	0 8	7 14	5 10	11 48
23	T	19 22 15	7 22	5 3	morn	4 16	7 17	5 7	morn	1 2	7 14	5 11	morn
24	W	19 7 51	7 22	5 4	1 0	5 14	7 17	5 8	0 57	2 0	7 13	5 12	0 55
25	T	18 53 6	7 21	5 5	2 8	6 21	7 16	5 9	2 5	3 7	7 12	5 13	2 1
26	F	18 38 0	7 20	5 6	3 12	7 28	7 16	5 10	3 9	4 14	7 12	5 15	3 4
27	S	18 22 34	7 19	5 8	4 13	8 34	7 15	5 11	4 9	5 20	7 11	5 16	4 5
28	G	18 6 48	7 18	5 9	5 8	9 35	7 14	5 13	5 4	6 21	7 10	5 17	5 0
29	M	17 50 43	7 17	5 10	5 59	10 29	7 13	5 14	5 55	7 15	7 9	5 18	5 51
30	T	17 34 18	7 16	5 12	rises.	11 14	7 12	5 15	rises.	8 0	7 8	5 19	rises.
31	W	17 17 35	7 15	5 13	6 29	11 59	7 12	5 16	6 30	8 45	7 8	5 20	6 33

Directions for taking Leaf Impressions.—Hold oiled paper in the smoke of a lamp, or of pitch, until it becomes coated with the smoke; to this paper apply the leaf of which you wish an impression, having previously warmed it between your hands, that it may be pliable. Place the lower surface of the leaf upon the blackened surface of the oil paper, that the numerous veins that are so prominent on this side may receive from the paper a portion of the smoke. Lay a paper over the leaf, and then press it gently upon the smoked paper, with the fingers, or with a small roller (covered with woolen cloth, or some like soft material,) so that every part of the leaf may come in

2d MONTH. FEBRUARY, 1866. 28 DAYS.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
THIRD QUARTER,....	7	2 55 ev.	2 43 ev.	2 31 ev.	1	12 13 55
NEW MOON, ...	15	5 29 mo.	5 17 mo.	5 5 mo.	9	12 14 30
FIRST QUARTER,..... 22d.*	21	* 4 mo.	11 52 ev.	11 40 ev.	17	12 14 16
					25	12 13 16

					CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey. Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
DAY OF MONTH.	DAY OF WEEK.	Sun's declens. S.			SUN rises	SUN sets.	MOON sets.	H. W. Bost.	SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	SUN rises	SUN sets.	MOON sets.
		°	'	"	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	17	0	34	7 14	5 14	7 29	ev.42	7 11	5 18	7 30	8 28	7 7	5 21	7 32
2	F	16	43	15	7 13	5 15	8 29	1 22	7 10	5 19	8 29	10 8	7 6	5 23	8 30
3	S	16	25	38	7 12	5 16	9 28	1 57	7 9	5 20	9 27	10 43	7 5	5 24	9 27
4	G	16	7	44	7 11	5 18	10 24	2 37	7 7	5 21	10 23	11 23	7 4	5 25	10 21
5	M	15	49	31	7 10	5 19	11 21	3 20	7 6	5 22	11 19	ev. 6	7 3	5 26	11 17
6	T	15	31	6	7 9	5 21	morn	4 5	7 5	5 23	morn	0 51	7 2	5 27	morn
7	W	15	12	24	7 8	5 22	0 18	4 48	7 4	5 25	0 15	1 34	7 1	5 28	0 12
8	T	14	53	26	7 6	5 23	1 14	5 47	7 3	5 26	1 11	2 33	7 0	5 29	1 7
9	F	14	34	12	7 5	4 24	2 8	6 43	7 2	5 27	2 4	3 29	6 59	5 30	2 0
10	S	14	14	44	7 4	5 25	3 1	7 41	7 1	5 28	2 56	4 27	6 58	5 32	2 52
11	G	13	55	2	7 2	5 26	3 53	8 40	7 0	5 30	3 48	5 26	6 57	5 33	3 44
12	M	13	35	6	7 1	5 28	4 40	9 36	6 58	5 31	4 37	6 22	6 55	5 34	4 32
13	T	13	14	57	7 0	5 29	5 25	10 26	6 57	5 32	5 22	7 12	6 54	5 35	5 18
14	W	12	54	35	6 59	5 30	sets.	11 11	6 56	5 34	sets.	7 57	6 53	5 36	sets.
15	T	12	34	0	6 57	5 32	6 12	morn	6 55	5 35	6 14	8 53	6 52	5 38	6 15
16	F	12	13	14	6 56	5 33	7 22	0 7	6 53	5 36	7 22	9 29	6 51	5 39	7 23
17	S	11	52	15	6 54	5 35	8 31	0 43	6 52	5 37	8 31	10 13	6 49	5 40	8 30
18	G	11	31	6	6 53	5 36	9 42	1 27	6 51	5 39	9 40	10 58	6 48	5 41	9 39
19	M	11	9	46	6 52	5 38	10 51	2 12	6 49	5 40	10 49	11 49	6 47	5 42	10 46
20	T	10	48	15	6 50	5 39	11 55	3 3	6 48	5 41	11 52	morn	6 46	5 44	11 49
21	W	10	26	35	6 48	5 40	morn	3 58	6 46	5 43	morn	0 44	6 44	5 45	morn
22	T	10	4	45	6 47	5 42	1 5	5 0	6 45	5 44	1 2	1 46	6 43	5 46	0 58
23	F	9	42	46	6 45	5 43	2 6	6 6	6 44	5 45	2 2	2 52	6 42	5 47	1 58
24	S	9	20	38	6 44	5 45	3 2	7 14	6 42	5 46	2 58	4 0	6 40	5 48	2 54
25	G	8	58	22	6 42	5 46	3 55	8 17	6 41	5 48	3 51	5 3	6 38	5 49	3 47
26	M	8	35	58	6 41	5 47	4 39	9 17	6 39	5 49	4 36	6 3	6 37	5 51	4 33
27	T	8	13	27	6 39	5 49	5 19	10 8	6 38	5 50	5 17	6 54	6 36	5 52	5 14
28	W	7	50	48	6 38	5 50	rises.	10 54	6 37	5 51	rises.	7 40	6 34	5 53	rises.

contact with the sooted oil-paper. A coating of the smoke will adhere to the leaf. Then remove the leaf carefully, and place the blackened surface on a sheet of white paper, not ruled, or in a book prepared for the purpose, covering the leaf with a clean slip of paper, and pressing upon it with the fingers, or roller, as before. Thus may be obtained the impression of a leaf, showing the perfect outlines, together with an accurate exhibition of the veins which extend in every direction through it, more correctly than the finest drawing. And this process is so simple, and the materials so easily obtained, that any person, with a little practice to enable him to apply the right quantity of smoke to the oil-paper, and give the leaf a proper pressure, can prepare beautiful leaf impressions, such as a naturalist would be proud to possess. There is another, and we think a better method of taking *leaf*

3d MONTH. MARCH, 1866. **31 DAYS.**

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
FULL MOON, ·········	1	7 8 mo.	6 56 mo.	6 44 mo.	1	12 12 32
THIRD QUARTER, ····	9	11 8 mo.	10 56 mo.	10 44 mo.	9	12 10 41
NEW MOON, ·········	16	4 53 ev.	4 41 ev.	4 29 ev.	17	12 8 28
FIRST QUARTER, ·····	23	8 18 mo.	8 6 mo.	7 54 mo.	25	12 6 3
FULL MOON, ········	30	11 47 ev.	11 35 ev.	11 23 ev.		

Day of Month.	Day of Week.	Sun's declens. S.	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon. SUN rises	SUN sets.	MOON sets.	H. W. Bost.	CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois. SUN rises	SUN sets.	MOON sets.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. SUN rises	SUN sets.	MOON sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	7 28 3	6 36	5 51	6 17	11 32	6 35	5 53	6 17	8 18	6 33	5 54	6 18
2	F	7 5 11	6 35	5 52	7 15	ev.12	6 34	5 53	7 15	8 58	6 32	5 55	7 15
3	S	6 42 13	6 33	5 53	8 13	0 51	6 32	5 54	8 12	9 37	6 30	5 56	8 12
4	G	6 19 10	6 31	5 54	9 11	1 27	6 30	5 55	9 9	10 13	6 29	5 57	9 7
5	M	5 56 1	6 30	5 55	10 7	2 3	6 29	5 56	10 4	10 49	6 27	5 57	10 2
6	T	5 32 48	6 28	5 56	11 3	2 43	6 27	5 57	11 0	11 29	6 26	5 58	10 57
7	W	5 9 29	6 26	5 57	11 58	3 28	6 25	5 58	11 54	ev.14	6 24	5 59	11 50
8	T	4 46 7	6 25	5 58	morn	4 16	6 24	5 59	morn	1 2	6 23	6 0	morn
9	F	4 22 41	6 23	5 59	0 52	5 8	6 22	6 0	0 48	1 54	6 21	6 1	0 44
10	S	3 59 12	6 21	6 0	1 42	6 6	6 20	6 1	1 38	2 52	6 20	6 2	1 33
11	G	3 35 39	6 20	6 2	2 31	7 7	6 19	6 2	2 27	3 53	6 18	6 3	2 23
12	M	3 12 4	6 18	6 3	3 16	8 7	6 17	6 3	3 12	4 53	6 17	6 4	3 8
13	T	2 48 27	6 16	6 4	3 58	9 5	6 16	6 4	3 55	5 51	6 15	6 5	3 52
14	W	2 24 48	6 14	6 5	4 37	9 58	6 14	6 5	4 35	6 44	6 13	6 6	4 33
15	T	2 1 7	6 13	6 6	5 15	10 47	6 12	6 6	5 13	7 33	6 12	6 7	5 12
16	F	1 37 26	6 11	6 7	sets.	11 33	6 11	6 8	sets.	8 19	6 10	6 8	sets.
17	S	1 13 44	6 9	6 9	7 22	morn	6 9	6 9	7 21	9 7	6 9	6 9	7 20
18	G	0 50 1	6 7	6 10	8 33	0 21	6 7	6 10	8 31	9 54	6 7	6 10	8 29
19	M	0 26 19	6 6	6 11	9 45	1 8	6 6	6 11	9 42	10 40	6 6	6 11	9 39
20	T	0 2 37	6 4	6 12	10 55	1 54	6 4	6 12	10 51	11 33	6 4	6 12	10 48
21	W	N 21 4	6 2	6 13	11 59	2 47	6 2	6 13	11 55	morn	6 3	6 13	11 50
22	T	0 44 44	6 0	6 14	morn	3 44	6 1	6 14	morn	0 30	6 1	6 14	morn
23	F	1 8 23	5 59	6 15	0 58	4 47	5 59	6 15	0 54	1 33	5 59	6 15	0 50
24	S	1 31 59	5 57	6 17	1 52	5 51	5 58	6 16	1 49	2 37	5 58	6 16	1 44
25	G	1 55 33	5 55	6 18	2 40	6 55	5 56	6 17	2 36	3 41	5 56	6 17	2 32
26	M	2 19 4	5 53	6 19	3 20	7 56	5 54	6 18	3 17	4 42	5 54	6 18	3 14
27	T	2 42 33	5 52	6 20	3 57	8 52	5 52	6 19	3 54	5 38	5 53	6 19	3 52
28	W	3 5 58	5 50	6 21	4 30	9 42	5 51	6 20	4 29	6 28	5 51	6 19	4 27
29	T	3 29 20	5 48	6 22	5 1	10 26	5 49	6 21	5 0	7 12	5 50	6 20	5 0
30	F	3 52 37	5 46	6 23	rises.	11 4	5 47	6 22	rises.	7 50	5 48	6 21	rises.
31	S	4 15 50	5 45	6 24	7 2	11 39	5 46	6 23	7 1	8 25	5 47	6 22	6 59

impressions, than the preceding one. The only difference in the process consists in the use of *printing ink*, instead of smoked oil-paper.

LEAF PRINTING.—After warming the leaf between the hands, apply printing ink, by means of a small leather ball containing cotton, or some soft substance, or with the end of the finger. The leather ball (and the finger when used for that purpose,) after the ink is applied to it, should be pressed several times on a piece of leather, or some smooth surface, before each application to the leaf, that the ink may be smoothly and evenly applied. After the under surface of the leaf has been sufficiently inked, apply it to the paper,

4th MONTH. APRIL, 1866. 30 DAYS.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
Third Quarter,	8	3 58 mo.	3 46 mo.	3 34 mo.	1	12 3 54
New Moon,	15	2 19 mo.	2 7 mo.	1 55 mo.	9	12 1 33
First Quarter,	21	5 47 ev.	5 35 ev.	5 23 ev.	17	11 59 30
Full Moon,	29	4 39 ev.	4 27 ev.	4 15 ev.	25	11 57 51

Day of Month.	Day of Week.	Sun's declens. N.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon. Sun rises	Sun sets.	Moon sets.	H. W. Bost.	CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois. Sun rises	Sun sets.	Moon sets.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. Sun rises	Sun sets.	Moon sets.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	G	4 38 59	5 43	6 25	7 59	ev.19	5 44	6 24	7 57	9 5	5 46	6 23	7 55
2	M	5 2 3	5 41	6 27	8 54	0 57	5 42	6 26	8 51	9 43	5 44	6 24	8 48
3	T	5 25 1	5 40	6 28	9 49	1 34	5 41	6 27	9 46	10 20	5 42	6 25	9 42
4	W	5 47 54	5 38	6 29	10 42	2 12	5 39	6 28	10 39	10 58	5 41	6 26	10.35
5	T	6 10 40	5 36	6 30	11 34	2 56	5 37	6 29	11 30	11 42	5 39	6 27	11 26
6	F	6 33 21	5 35	6 31	morn	3 44	5 36	6 30	morn	ev.30	5 37	6 28	morn
7	S	6 55 55	5 33	6 32	0 23	4 36	5 34	6 31	0 19	1 22	5 36	6 29	0 15
8	G	7 18 21	5 31	6 33	1 11	5 32	5 33	6 32	1 8	2 18	5 34	6 30	1 4
9	M	7 40 41	5 30	6 34	1 51	6 32	5 31	6 33	1 47	3 18	5 33	6 31	1 44
10	T	8 2 53	5 28	6 36	2 30	7 31	5 30	6 34	2 28	4 17	5 31	6 32	2 25
11	W	8 24 57	4 26	6 37	3 10	8 32	5 28	6 35	3 6	5 18	5 30	6 33	3 4
12	T	8 46 52	5 25	6 38	3 44	9 29	5 26	6 36	3 43	6 15	5 28	6 34	3 43
13	F	9 8 39	5 23	6 39	4 21	10 22	5 25	6 37	4 21	7 8	5 27	6 35	4 21
14	S	9 30 17	5 21	6 40	sets.	11 8	5 24	6 38	sets.	7 54	5 25	6 36	sets.
15	G	9 51 45	5 20	6 41	7 20	11 58	5 22	6 39	7 18	8 44	5 24	6 37	7 15
16	M	10 13 3	5 18	6 42	8 33	morn	5 20	6 40	8 30	9 35	5 23	6 38	8 27
17	T	10 34 12	5 16	6 43	9 43	0 49	5 19	6 41	9 40	10 25	5 21	6 39	9 36
18	W	10 55 10	3 15	6 45	10 47	1 39	5 17	6 42	10 43	11 17	5 20	6 40	10 39
19	T	11 15 57	5 13	6 46	11 46	2 31	5 16	6 43	11 42	morn	5 18	6 41	11 38
20	F	11 36 33	5 12	6 47	morn	3 30	5 14	6 44	morn	0 16	5 17	6 42	morn
21	S	11 56 57	5 10	6 48	0 36	4 29	5 13	6 45	0 32	1 15	5 16	6 42	0 28
22	G	12 17 10	5 9	6 49	1 19	5 29	5 11	6 46	1 16	2 15	5 14	6 43	1 13
23	M	12 37 10	5 7	6 50	1 58	6 30	5 10	6 47	1 56	3 16	5 13	6 44	1 53
24	T	12 56 58	5 6	6 51	2 32	7 26	5 8	6 48	2 30	4 12	5 11	6 45	2 29
25	W	13 16 34	5 4	6 52	3 3	8 19	5 7	6 49	3 2	5 5	5 10	3 46	3 .2
26	T	13 35 56	5 3	6 53	3 34	9 8	5 6	6 50	3 34	5 54	5 9	6 47	3 31
27	F	13 55 5	5 1	6 55	4 3	9 5[illegible]	5 4	6 51	4 4	6 39	5 8	6 48	4 4
28	S	14 14 0	5 0	6 56	4 32	10 3[illegible]	5 3	6 52	4 34	7 19	5 6	6 49	4 35
29	G	14 32 41	4 58	6 57	rises.	11 [illegible]	5 2	6 53	rises.	7 55	5 5	6 50	rises.
30	M	14 51 7	4 57	6 58	7 44	11 48	5 0	6 55	7 41	8 34	5 4	6 51	7 38

where you wish the impression: and after covering it with a slip of paper, use the hand or roller to press upon it, as described in the former process.

Plant Skeletons.—The leaves are to be put into an earthen or glass vessel, and a large quantity of rain water to be poured over them; after this they are to be left to the open air and to the heat of the sun, without covering the vessel. When the water evaporates so as to leave the leaves dry, more must be added in its place; the leaves will by this means putrefy, but they will require a different time for this: some will be finished in a month, others will require two months or longer according to the toughness of their parenchyma. When they have been in a state of putrefaction for some time,

5th MONTH. MAY, 1866. 31 DAYS.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
Third Quarter,....	7	4 58 ev.	4 46 ev.	4 34 ev.	1	11 56 56
New Moon,.........	14	10 14 mo.	10 2 mo.	9 50 mo.	9	11 56 14
First Quarter,.....	21	5 14 mo.	5 2 mo.	4 50 mo.	17	11 56 9
Full Moon,........	29	8 34 mo.	8 22 mo.	8 10 mo.	25	11 56 39

			CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Mis'ri, and California.		
DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.	SUN rises	SUN sets.	MOON rises.	H. W. Bost.	SUN rises	SUN sets.	MOON rises.	H. W. N. Y.	SUN rises	SUN sets.	MOON rises.
		° ' "	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	15 9 19	4 56	7 0	8 38	ev. 29	4 59	6 56	8 35	9 15	5 2	6 52	8 51
2	W	15 27 16	4 54	7 1	9 30	1 9	4 58	6 57	9 26	9 55	5 1	6 53	9 22
3	T	15 44 58	4 53	7 2	10 21	1 48	4 56	6 58	10 17	10 34	5 0	6 54	10 13
4	F	16 2 25	4 52	7 3	11 5	2 31	4 55	6 59	11 2	11 17	4 59	6 55	10 58
5	S	16 19 35	4 51	7 4	11 48	3 17	4 54	7 0	11 44	ev. 3	4 58	6 56	11 41
6	G	16 36 29	4 49	7 5	morn	4 7	4 53	7 1	morn	0 53	4 57	6 57	morn
7	M	16 53 7	4 48	7 6	0 27	5 1	4 52	7 2	0 24	1 47	4 55	6 58	0 21
8	T	17 9 28	4 47	7 7	1 5	5 58	4 51	7 3	1 3	2 44	4 54	6 59	1 1
9	W	17 25 32	4 46	7 8	1 40	7 0	4 49	7 4	1 39	3 46	4 53	7 0	1 38
10	T	17 41 19	4 44	7 9	2 15	7 59	4 48	7 5	2 15	4 45	4 52	7 1	2 14
11	F	17 56 47	4 43	7 10	2 52	8 59	4 47	7 6	2 52	5 45	4 51	7 2	2 53
12	S	18 11 58	4 42	7 11	3 29	9 56	4 46	7 7	3 31	6 42	4 50	7 2	3 32
13	G	18 26 51	4 41	7 12	4 31	10 50	4 45	7 8	4 33	7 36	4 49	7 3	4 36
14	M	18 41 25	4 40	7 13	sets.	11 39	4 44	7 9	sets.	8 25	4 49	7 4	sets.
15	T	18 55 40	4 39	7 14	8 28	morn	4 43	7 10	8 24	9 22	4 48	7 5	8 20
16	W	19 9 36	4 38	7 15	9 31	0 36	4 42	7 11	9 27	10 14	4 47	7 6	9 22
17	T	19 23 13	4 37	7 16	10 27	1 28	4 41	7 12	10 23	11 5	4 46	7 7	10 19
18	F	19 36 30	4 36	7 17	11 15	2 17	4 40	7 13	11 11	11 56	4 45	7 8	11 8
19	S	19 49 27	4 35	7 18	11 57	3 10	4 39	7 14	11 56	morn	4 44	7 9	11 52
20	G	20 2 4	4 34	7 19	morn	4 5	4 39	7 15	morn	0 51	4 43	7 10	morn
21	M	20 14 20	4 33	7 20	0 33	4 59	4 38	7 16	0 31	1 45	4 43	7 10	0 29
22	T	20 26 15	4 32	7 21	1 6	5 53	4 37	7 17	1 5	2 39	4 42	7 11	1 4
23	W	20 37 50	4 31	7 22	1 37	6 48	4 36	7 18	1 37	3 34	4 41	7 12	1 36
24	T	20 49 3	4 31	7 23	2 6	7 40	4 36	7 19	2 7	4 26	4 41	7 13	2 7
25	F	20 59 55	4 30	7 24	2 35	8 30	4 35	7 20	2 36	5 16	4 40	7 14	2 38
26	S	21 10 25	4 29	7 25	3 6	9 17	4 34	7 20	3 8	6 3	4 39	7 14	3 10
27	G	21 20 33	4 29	7 26	3 38	10 1	4 34	7 21	3 41	6 47	4 39	7 15	3 44
28	M	21 30 19	4 28	7 27	rises.	10 43	4 33	7 22	rises.	7 29	4 38	7 16	rises.
29	T	21 39 43	4 27	7 28	7 26	11 21	4 32	7 23	7 22	8 7	4 38	7 17	7 18
30	W	21 48 44	4 27	7 28	8 18	ev. 3	4 32	7 23	8 14	8 49	4 37	7 17	8 10
31	T	21 57 23	4 26	7 29	9 5	0 46	4 31	7 24	9 1	9 32	4 37	7 18	8 57

the two membranes will begin to separate, and the green part of the leaf to become fluid; then the operation of clearing is to be performed The leaf is to be put upon a flat white earthen plate and covered with clear water; and being gently squeezed with the finger, the membranes will begin to open, and the green substance will come out at the edges; the membranes must be carefully taken off with the finger, and great caution must be used in separating them near the middle rib. When once there is an opening towards this separation, the whole membrane always follows easily; when both membranes are taken off, the skeleton is finished, and it has to be washed

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
THIRD QUARTER,	6	2 29 mo.	2 17 mo.	2 5 mo.	1	11 57 31
NEW MOON,	12	5 23 ev.	5 11 ev.	4 59 ev.	9	11 58 55
FIRST QUARTER,	19	7 1 ev.	6 49 ev.	6 37 ev.	17	12 0 34
FULL MOON,	27	10 51 ev.	10 39 ev.	10 27 ev.	25	12 2 17

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon. SUN rises	SUN sets.	MOON rises.	H. W. Bost.	CALENDAR For N. York City, Philadelphia, Conn., N. Jersey. Penn.. Ohio, Indiana and Illinois. SUN rises	SUN sets.	MOON rises.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. SUN rises	SUN sets.	MOON rises.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	F	22 5 38	4 25	7 30	9 49	1 29	4 31	7 24	9 45	10 15	4 36	7 19	9 41
2	S	22 13 31	4 25	7 30	10 29	2 7	4 30	7 25	10 26	10 53	4 36	7 19	10 23
3	G	22 21 0	4 25	7 31	11 6	2 53	4 30	7 26	11 3	11 39	4 36	7 20	11 1
4	M	22 28 6	4 24	7 32	11 42	3 47	4 30	7 26	11 40	ev.33	4 35	7 21	11 38
5	T	22 34 49	4 24	7 32	morn	4 33	4 29	7 27	morn	1 19	4 35	7 21	morn
6	W	22 41 7	4 24	7 33	0 15	5 27	4 29	7 28	0 14	2 13	4 35	7 22	0 13
7	T	22 47 3	4 23	7 33	0 49	6 29	4 29	7 28	0 49	3 15	4 34	7 23	0 49
8	F	22 52 33	4 23	7 34	1 25	7 32	4 29	7 29	1 26	4 18	4 34	7 23	1 26
9	S	22 57 40	4 23	7 35	2 3	8 35	4 28	7 30	2 5	5 21	4 34	7 24	2 7
10	G	23 2 23	4 23	7 36	2 45	9 36	4 28	7 30	2 48	6 22	4 34	7 24	2 51
11	M	23 6 42	4 22	7 36	3 33	10 33	4 28	7 31	3 37	7 19	4 34	7 25	3 40
12	T	23 10 36	4 22	7 37	sets.	11 25	4 28	7 31	sets.	8 11	4 34	7 25	sets.
13	W	23 14 5	4 22	7 37	8 11	morn	4 28	7 32	8 7	9 5	4 34	7 26	8 3
14	T	23 17 10	4 22	7 38	9 6	0 19	4 28	7 32	9 2	9 57	4 34	7 26	8 58
15	F	23 19 51	4 22	7 38	9 52	1 11	4 28	7 32	9 49	10 43	4 34	7 26	9 46
16	S	23 22 7	4 22	7 38	10 31	1 57	4 28	7 33	10 29	11 31	4 34	7 27	10 27
17	G	23 23 58	4 22	7 39	11 7	2 45	4 28	7 33	11 6	morn	4 34	7 27	11 4
18	M	23 25 24	4 22	7 39	11 39	3 34	4 28	7 33	11 39	0 20	4 34	7 28	11 38
19	T	23 26 26	4 22	7 39	morn	4 24	4 28	7 34	morn	1 10	4 34	7 28	morn
20	W	23 37 2	4 23	7 40	0 10	5 13	4 29	7 34	0 10	1 59	4 34	7 28	0 10
21	T	23 27 14	4 23	7 40	0 39	6 5	4 29	7 34	0 40	2 51	4 34	7 28	0 40
22	F	23 27 1	4 23	7 40	1 9	6 58	4 29	7 34	1 11	3 44	4 35	7 28	1 12
23	S	23 26 24	4 23	7 40	1 39	7 48	4 29	7 34	1 42	4 34	4 35	7 29	1 44
24	G	23 25 21	4 23	7 40	2 14	8 39	4 29	7 35	2 17	5 26	4 35	7 29	2 20
25	M	23 22 54	4 24	7 41	2 49	9 29	4 30	7 35	2 53	6 15	4 35	7 29	2 57
26	T	23 22 2	4 24	7 41	3 32	10 16	4 30	7 35	3 36	7 2	4 36	7 29	3 40
27	W	23 19 46	4 24	7 41	rises.	10 58	4 30	7 35	rises.	7 44	4 36	7 29	rises.
28	T	23 17 4	4 25	7 40	7 48	11 30	4 29	7 35	7 44	8 25	4 37	7 29	7 40
29	F	23 13 59	4 25	7 40	8 30	ev.25	4 29	7 35	8 27	9 11	4 37	7 29	8 23
30	S	23 10 28	4 26	7 40	9 9	1 6	4 29	7 35	9 6	9 52	4 37	7 29	9 3

clean with water, and then dried between the leaves of a book. Fruits are divested of their pulp and made into skeletons in a different manner. Take, for an instance, a fine large pear which is soft, and not tough; let it be neatly pared without squeezing it. and without injuring either the crown or the stalk; put it into a pot of rain-water, covered, set it over the fire, and let it boil gently till perfectly soft, then take it out and lay it in a dish filled with cold water; then holding it by the stalk with one hand, rub off as much of the pulp as you can with the finger and thumb, beginning at the stalk, and rubbing it regularly towards the crown. The fibres are most tender towards the extremities and are therefore to be treated with great care there. When

7th MONTH. JULY, 1866. **31 DAYS.**

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington. H. M.	Sun on Merid. or noon mark. D.	H. M. S.
THIRD QUARTER,	5	9 20 mo.	9 8 mo.	8 56 mo.	1	12 3 30
NEW MOON,	12	0 51 mo.	0 39 mo.	0 27 mo.	9	12 4 53
FIRST QUARTER,	19	10 59 mo.	10 47 mo.	10 35 mo.	17	12 5 50
FULL MOON,	27	11 29 mo.	11 17 mo.	11 5 mo.	25	12 6 13

			CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.	SUN rises.	SUN sets.	MOON rises.	H. W. Bost.	SUN rises.	SUN sets.	MOON rises.	H. W. N. Y.	SUN rises.	SUN sets.	MOON rises.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	G	23 6 34	4 26	7 40	9 45	1 47	4 32	7 35	9 43	10 33	4 38	7 30	9 41
2	M	23 2 15	4 26	7 40	10 10	2 29	4 32	7 35	10 18	11 15	4 38	7 29	10 17
3	T	22 57 32	4 27	7 40	10 52	3 17	4 33	7 34	10 52	ev. 3	4 39	7 29	10 51
4	W	22 52 35	4 28	7 40	11 26	4 7	4 33	7 34	11 26	0 53	4 39	7 28	11 27
5	T	22 46 54	4 29	7 39	morn	5 2	4 34	7 34	morn	1 48	4 40	7 28	morn
6	F	22 41 0	4 29	7 39	0 2	6 4	4 35	7 34	0 3	2 50	4 41	7 28	0 5
7	S	22 34 42	4 30	7 39	0 41	7 7	4 35	7 33	0 43	3 53	4 41	7 28	0 46
8	G	22 28 0	4 30	7 38	1 24	8 14	4 36	7 33	1 27	5 0	4 42	7 27	1 31
9	M	22 20 55	4 31	7 38	2 14	9 20	4 37	7 33	2 17	6 6	4 42	7 27	2 21
10	T	22 13 26	4 32	7 38	3 9	10 20	4 37	7 32	3 13	7 6	4 43	7 27	3 17
11	W	22 5 35	4 33	7 37	sets.	11 11	4 38	7 32	sets.	7 57	4 44	7 26	sets.
12	T	21 57 21	4 33	7 37	7 42	morn	4 39	7 31	7 39	8 48	4 44	7 26	7 35
13	F	21 48 45	4 34	7 36	8 25	0 2	4 39	7 31	8 23	9 37	4 45	7 26	8 20
14	S	21 39 46	4 35	7 36	9 4	0 51	4 40	7 30	9 2	10 21	4 46	7 25	9 0
15	G	21 30 25	4 36	7 35	9 38	1 35	4 41	7 30	9 37	11 2	4 46	7 24	9 36
16	M	21 20 42	4 37	7 34	10 9	2 16	4 42	7 29	10 9	11 45	4 47	7 24	10 9
17	T	21 10 37	4 37	7 34	10 40	2 59	4 43	7 29	10 40	morn	4 48	7 23	10 4
18	W	21 0 11	4 38	7 33	11 9	3 41	4 44	7 28	11 11	0 30	4 49	7 23	11 12
19	T	20 49 23	4 39	7 32	11 41	4 31	4 44	7 27	11 48	1 17	4 50	7 22	11 45
20	F	20 38 15	4 40	7 31	morn	5 28	4 45	7 26	morn	2 11	4 51	7 21	morn
21	S	20 26 45	4 41	7 30	0 13	6 13	4 46	7 26	0 16	2 59	4 52	7 21	0 19
22	G	20 14 55	4 42	7 30	0 50	7 8	4 47	7 25	0 55	3 54	4 52	7 20	0 57
23	M	20 2 45	4 43	7 29	1 29	8 1	4 48	7 24	1 33	4 47	4 53	7 19	1 37
24	T	19 50 15	4 44	7 28	2 18	8 57	4 48	7 23	2 18	5 43	4 54	7 18	2 22
25	W	19 37 25	4 45	7 27	3 2	9 48	4 49	7 23	3 7	6 34	4 55	7 18	3 11
26	T	19 24 15	4 46	7 26	3 56	10 35	4 50	7 22	4 0	7 21	4 56	7 17	4 4
27	F	19 10 40	4 47	7 25	rises.	11 18	4 51	7 21	rises.	8 4	4 57	7 16	rises.
28	S	18 56 58	4 48	7 24	7 47	ev. 1	4 52	7 20	7 45	8 47	4 58	7 15	7 43
29	G	18 42 51	4 49	7 23	8 21	0 45	4 53	7 19	8 19	9 31	4 58	7 14	8 18
30	M	18 28 26	4 50	7 22	8 50	1 26	4 54	7 18	8 55	10 12	4 59	7 13	8 55
31	T	18 13 43	4 51	7 21	9 30	2 8	4 55	7 17	9 30	10 51	4 59	7 12	9 31

the pulp has thus been cleared pretty well off, the point of a fine pen-knife may be of use to pick away the pulp sticking to the core. In order to see how the operation advances, the soiled water must be thrown away from time to time, and clean poured on in its place. When the pulp is in this manner perfectly separated, the clean skeleton is to be preserved in spirits of wine. This method may be pursued with the bark of trees, which afford interesting views of their constituent fibres.

COFFEE A DISINFECTANT.—Numerous experiments with roasted coffee prove that it is the most powerful means, not only of rendering animal and vegeta-

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
Third Quarter,	3	2 23 ev.	2 21 ev.	2 9 ev.	1	12 6 2
New Moon,	10	9 52 mo.	9 40 mo.	9 28 mo.	9	12 5 14
First Quarter,	18	4 32 mo.	4 20 mo.	4 8 mo.	17	12 3 50
Full Moon,	25	10 49 ev.	11 37 ev.	10 25 ev.	25	12 1 53

DAY OF MONTH	DAY OF WEEK	Sun's declens. N.	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			SUN rises	SUN sets.	MOON rises.	H. W. Bost.	SUN rises	SUN sets.	MOON rises.	H. W. N. Y.	SUN rises	SUN sets.	MOON rises.
		° ' "	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	W	17 58 41	4 52	7 20	10 5	2 54	4 56	7 16	10 6	11 40	5 0	7 11	10 7
2	T	17 43 22	4 53	7 18	10 41	3 45	4 57	7 14	10 44	ev.31	5 1	7 10	10 46
3	F	17 27 45	4 54	7 17	11 22	4 42	4 58	7 13	11 25	1 28	5 2	7 9	11 28
4	S	17 11 52	4 55	7 16	morn	5 45	4 59	7 12	morn	2 31	5 3	7 8	morn
5	G	16 55 41	4 56	7 15	0 9	6 53	5 0	7 11	0 12	3 39	5 4	7 7	0 16
6	M	16 39 14	4 57	7 14	1 0	8 2	5 1	7 10	1 4	4 48	5 5	7 6	1 8
7	T	16 22 31	4 58	7 12	1 56	9 6	5 2	7 9	2 1	5 52	5 6	7 5	2 5
8	W	16 5 32	4 59	7 11	2 58	10 5	5 3	7 7	3 2	6 51	5 6	7 4	3 6
9	T	15 48 18	5 0	7 10	4 1	10 57	5 4	7 6	4 4	7 43	5 7	7 2	4 8
10	F	15 30 48	5 1	7 8	sets.	11 40	5 5	7 5	sets.	8 26	5 8	7 1	sets.
11	S	15 13 3	5 2	7 7	7 36	morn	5 6	7 4	7 35	9 13	5 9	7 0	7 33
12	G	14 55 8	5 3	7 6	8 9	0 27	5 7	7 2	8 9	9 53	5 10	6 59	8 8
13	M	14 36 51	5 4	7 4	8 39	1 7	5 8	7 1	8 39	10 31	5 11	6 58	8 40
14	T	14 18 23	5 5	7 3	9 10	1 45	5 9	7 0	9 11	11 10	5 12	6 56	9 12
15	W	13 59 42	5 6	7 1	9 41	2 24	5 10	6 58	9 43	11 52	5 13	6 54	9 44
16	T	13 40 48	5 7	7 0	10 14	3 6	5 11	6 57	10 16	morn	5 14	6 53	10 19
17	F	13 21 40	5 8	6 58	10 48	3 51	5 12	6 55	10 51	0 37	5 15	6 52	10 54
18	S	13 2 20	5 10	6 57	11 25	4 40	5 13	6 54	11 29	1 26	5 16	6 51	11 33
19	G	12 42 48	5 11	6 55	morn	5 32	5 14	6 53	morn	2 18	5 17	6 50	morn
20	M	12 23 4	5 12	6 54	0 7	6 27	5 15	6 51	0 10	3 13	5 17	6 48	0 14
21	T	12 3 7	5 13	6 52	0 55	7 25	5 16	6 50	0 59	4 11	5 18	6 47	1 3
22	W	11 43 0	5 14	6 51	1 46	8 23	5 17	6 48	1 49	5 9	5 19	6 45	1 54
23	T	11 22 41	5 15	6 49	2 42	9 18	5 17	6 47	2 46	6 4	5 20	6 44	2 49
24	F	11 2 12	5 16	6 48	3 41	10 8	5 18	6 45	3 44	6 54	5 21	6 43	3 47
25	S	10 41 32	5 17	6 46	rises.	10 55	5 19	6 44	rises.	7 41	5 22	6 41	rises.
26	G	10 20 42	5 18	6 44	6 56	11 35	5 20	6 42	6 55	8 21	5 23	6 40	6 55
27	M	9 59 41	5 19	6 43	7 30	ev.22	5 21	6 41	7 30	9 8	5 24	6 38	7 30
28	T	9 38 32	5 20	6 41	8 6	1 5	5 22	6 39	8 7	9 51	5 25	6 37	8 8
29	W	9 17 13	5 21	6 39	8 43	1 49	5 23	6 37	8 44	10 35	5 26	6 35	8 48
30	T	8 55 45	2 22	6 38	9 25	2 34	5 24	6 36	9 27	11 20	5 26	6 34	9 30
31	F	8 31 9	5 23	6 36	10 6	3 28	5 25	6 34	10 10	ev 14	5 27	6 32	10 13

ble effluvia innocuous, but of absolutely destroying them. A room in which meat in an advanced degree of decomposition had been kept for some time, was instantly deprived of all smell on an open coffee-rouster being carried through it. containing a pound of coffee newly roasted. In another room, exposed to the effluvium occasioned by the clearing out of the dung-pit, so that sulphuretted hydrogen and ammonia in great quantities could be chemically detected, the stench was completely removed in half a minute on the employment of three ounces of fresh roasted coffee, whilst the other parts of the house were permanently cleared of the same smell, by being simply tra-

9th MONTH. SEPTEMBER, 1866. 30 DAYS.

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
THIRD QUARTER,	1	7 25 ev.	7 13 ev.	7 1 ev.	1	11 59 49
NEW MOON,	8	9 30 ev.	9 18 ev.	9 6 ev.	9	11 57 10
FIRST QUARTER,	16	10 44 ev.	10 32 ev.	10 20 ev.	17	11 54 23
FULL MOON,	24	9 21 mo.	9 9 mo.	8 57 mo.	25	11 51 35

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. N.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon. SUN rises	SUN sets.	MOON rises.	H. W. Bost.	CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois. SUN rises	SUN sets.	MOON rises.	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California. SUN rises	SUN sets.	MOON rises.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	S	8 12 24	5 24	6 35	10 56	4 27	5 26	6 33	11 0	1 13	5 28	6 31	11 4
2	G	7 50 31	5 26	6 33	11 51	5 31	5 27	6 31	11 55	2 17	5 29	6 29	11 39
3	M	7 28 30	5 27	6 31	morn	6 39	5 28	6 29	morn	3 25	5 30	6 28	morn
4	T	7 6 22	5 28	6 29	0 48	7 47	5 29	6 28	0 52	4 33	5 31	6 26	0 56
5	W	6 44 7	5 29	6 28	1 51	8 51	5 30	6 26	1 55	5 37	5 32	6 25	1 58
6	T	6 21 46	5 30	6 26	2 54	9 47	5 31	6 25	2 57	6 33	5 33	6 23	3 0
7	F	5 59 18	5 31	6 24	3 56	10 34	5 32	6 23	3 58	7 20	5 34	6 22	4 1
8	S	5 36 44	5 32	6 22	sets.	11 15	5 33	6 21	sets.	8 1	5 35	6 21	sets.
9	G	5 14 4	5 33	6 21	6 39	11 56	5 34	6 20	6 39	8 42	5 35	6 20	6 39
10	M	4 51 19	5 34	6 19	7 9	morn	5 35	6 18	7 10	9 23	5 36	6 18	7 11
11	T	4 28 29	5 35	6 17	7 41	0 37	5 36	6 16	7 42	10 1	5 37	6 17	7 44
12	W	4 5 35	5 36	6 15	8 13	1 15	5 37	6 15	8 15	10 39	5 38	6 15	8 17
13	T	3 42 36	5 37	6 14	8 46	1 53	5 38	6 13	8 49	11 17	5 39	6 14	8 52
14	F	3 19 33	5 38	6 12	9 23	2 31	5 39	6 11	9 26	morn	5 40	6 12	9 30
15	S	2 56 27	5 39	6 10	10 2	3 15	5 40	6 9	10 6	0 1	5 41	6 10	10 10
16	G	2 33 17	5 40	6 8	10 47	4 2	5 41	6 8	10 51	0 48	5 42	6 9	10 55
17	M	2 10 4	5 41	6 7	11 35	4 55	5 42	6 6	11 39	1 41	5 43	6 7	11 43
18	T	1 46 49	5 43	6 5	morn	5 50	5 43	6 4	morn	2 36	5 44	6 6	morn
19	W	1 23 32	5 44	6 3	0 29	6 50	5 44	6 3	0 32	3 36	5 44	6 4	0 36
20	T	1 0 12	5 45	6 1	1 26	7 47	5 45	6 1	1 29	4 33	5 45	6 2	1 32
21	F	0 36 51	5 46	6 0	2 26	8 45	5 46	5 59	2 29	5 31	5 46	6 1	2 32
22	S	0 13 29	5 47	5 58	3 30	9 38	5 47	5 58	3 31	6 24	5 47	5 59	3 33
23	G	S. 9 55	5 48	5 56	4 37	10 27	5 48	5 56	4 38	7 13	5 48	5 58	4 38
24	M	0 33 19	5 49	5 54	rises.	11 11	5 49	5 54	rises.	7 57	5 49	5 56	rises.
25	T	0 56 43	5 50	5 53	6 42	11 57	5 50	5 53	6 43	8 43	5 50	5 54	6 44
26	W	1 20 7	5 51	5 51	7 21	ev.45	5 51	5 52	7 23	9 31	5 51	5 53	7 26
27	T	1 43 31	5 52	5 49	8 5	1 32	5 52	5 50	8 8	10 18	5 52	5 51	8 11
28	F	2 6 54	5 53	5 47	8 53	2 20	5 53	5 48	8 57	11 6	5 53	5 50	9 1
29	S	2 30 17	5 54	5 46	9 46	3 16	5 54	5 46	9 50	ev. 2	5 54	5 48	9 54
30	G	2 53 37	5 56	5 44	10 43	4 16	5 54	5 44	10 47	1 2	5 55	5 46	10 51

versed with the coffee-roaster, although the cleansing of the dung-pit continued for several hours after. The best mode of using the coffee as a disinfectant is to dry the raw bean, pound it in a mortar, and then roast the powder on a moderately heated iron plate, until it assumes a dark brown tint, when it is fit for use. Then sprinkle it in sinks or cess-pools, or lay it on a plate in the room which you wish to have purified. Coffee acid or coffee oil acts more readily in minute quantities.

THE CHEMICAL BAROMETER.—Take a long narrow bottle, such as an old fashioned Eau-de-Cologne bottle, and put into it two and a half drachms of camphor, and eleven drachms of spirits of wine; when the camphor is dis-

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
THIRD QUARTER,....	1	1 25 mo.	1 13 mo.	1 1 mo.	1	11 49 36
NEW MOON,.........	8	0 14 ev.	0 2 ev.	11 50 mo.	9	11 47 16
FIRST QUARTER,.....	16	4 39 ev.	4 27 ev.	4 15 ev.	17	11 45 24
FULL MOON,........	23	7 29 ev.	7 17 ev.	7 5 ev.	25	11 44 9
THIRD QUARTER,....	30	10 1 mo.	9 49 mo.	9 37 mo		

DAY OF MONTH.	DAY OF WEEK.	Sun's declens. S.	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			SUN rises	SUN sets.	MOON rises.	H. W. Bost.	SUN rises	SUN sets.	MOON rises.	H. W. N. Y.	SUN rises	SUN sets.	MOON rises.
		° ' "	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	M	3 16 56	5 57	5 42	11 44	5 19	5 56	5 43	11 48	2 5	5 55	5 43	11 52
2	T	3 40 14	5 58	5 40	morn	6 27	5 57	5 41	morn	3 13	5 56	5 42	morn
3	W	4 3 28	5 59	5 39	0 47	7 29	5 58	5 39	0 50	4 15	5 57	5 40	0 53
4	T	4 26 40	6 0	5 37	1 48	8 28	5 59	5 38	1 51	5 14	5 58	5 39	1 53
5	F	4 49 49	6 1	5 35	2 50	9 21	6 0	5 36	2 52	6 7	5 59	5 37	2 54
6	S	5 12 54	6 2	5 33	3 51	10 7	6 1	5 35	3 52	6 53	6 0	5 35	3 53
7	G	5 35 55	6 3	5 32	4 52	10 49	6 2	5 33	4 52	7 35	6 1	5 34	4 52
8	M	5 58 52	6 4	5 30	sets.	11 25	6 3	5 31	sets.	8 11	6 2	5 32	sets.
9	T	6 21 45	6 6	5 28	6 13	morn	6 4	5 30	6 15	8 52	6 3	5 31	6 17
10	W	6 44 32	6 7	5 27	6 46	0 6	6 5	5 28	6 48	9 31	6 4	5 29	6 51
11	T	7 7 14	6 8	5 25	7 21	0 45	6 7	5 27	7 24	10 8	6 5	5 28	7 27
12	F	7 29 50	6 9	5 23	7 59	1 22	6 8	5 25	8 3	10 40	6 6	2 26	8 7
13	S	7 52 20	6 10	5 22	8 42	2 0	6 9	5 23	8 45	11 29	6 7	5 25	8 50
14	G	8 14 43	6 11	5 20	9 28	2 43	6 10	5 22	9 32	morn	6 8	5 23	9 36
15	M	8 37 0	6 13	5 19	10 19	3 30	6 11	5 20	10 22	0 16	6 9	5 22	10 27
16	T	8 59 8	6 14	5 17	11 12	4 20	6 12	5 19	11 16	1 6	6 10	5 21	11 19
17	W	9 21 9	6 15	5 15	morn	5 13	6 13	5 17	morn	1 59	6 11	5 19	morn
18	T	9 43 2	6 16	5 14	0 10	6 10	6 14	5 16	0 13	2 56	6 12	5 18	0 16
19	F	10 4 47	6 17	5 12	1 11	7 9	6 15	5 14	1 13	3 55	6 13	5 16	1 15
20	S	10 26 22	6 18	5 11	2 16	8 8	6 16	5 13	2 17	4 54	6 14	5 15	2 18
21	G	10 47 48	6 20	5 9	3 21	9 4	6 18	5 12	3 22	5 50	6 15	5 14	3 23
22	M	11 9 4	6 21	5 8	4 30	9 57	6 19	5 10	4 30	6 43	6 16	5 13	4 29
23	T	11 30 11	6 22	5 6	rises.	10 48	6 20	5 9	rises.	7 34	6 18	5 11	rises.
24	W	11 51 7	6 23	5 5	5 55	11 33	6 21	5 7	5 58	8 19	6 19	5 10	6 1
25	T	12 11 52	6 24	5 3	6 43	ev.26	6 22	5 6	6 47	9 12	6 20	5 9	6 50
26	F	12 32 26	6 26	5 2	7 38	1 18	6 23	5 4	7 41	10 4	6 21	5 8	7 46
27	S	12 52 48	6 27	5 1	8 36	2 8	6 24	5 3	8 40	10 54	6 22	5 6	8 44
28	G	13 12 58	6 23	4 59	9 36	3 4	6 26	5 2	9 40	11 50	6 23	5 5	9 44
29	M	13 32 56	6 29	4 57	10 39	4 2	6 27	5 1	10 43	ev.48	6 24	5 4	10 46
30	T	13 42 41	6 31	4 57	11 43	5 2	6 28	4 59	11 45	1 48	6 25	5 2	11 48
31	W	14 12 13	6 32	4 55	morn	6 4	6 29	4 58	morn	2 50	6 26	5 1	morn

solved, which it will readily do by slight agitation, add the following mixture:—Take water, nine drachms; nitrate of potash (saltpetre,) thirty-eight grains; and muriate of ammonia (sal ammoniac,) thirty-eight grains. Dissolve these salts in the water prior to mixing with the camphorated spirit; then shake the whole well together. Cork the bottle well, and wax the top, but afterwards make a very small aperture in the cork with a red-hot needle. The bottle then may be hung up, or placed in any stationary position. By observing the different appearances which the materials assume, as the weather changes, it becomes an excellent prognosticator of a storm or of a sunny ky.

11th MONTH. NOVEMBER, 1866. 30 DAYS.

MOON'S PHASES.		Boston.	New-York.	Washington	Sun on Merid. or noon mark.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
New Moon, ...	7	5 40 mo.	5 28 mo.	5 16 mo.	1	11 43 42
First Quarter, ...	15	9 23 mo.	9 11 mo.	8 59 mo.	9	11 43 59
Full Moon, ...	22	5 31 mo.	5 19 mo.	5 7 mo.	17	11 45 10
Third Quarter, ...	28	10 21 ev.	10 9 ev.	9 57 ev.	25	11 47 13

Day of Month.	Day of Week.	Sun's declens. S.	CALENDAR For Boston, New England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			SUN rises	SUN sets.	MOON rises.	H. W. Bost.	SUN rises	SUN sets.	MOON rises.	H. W. N. Y.	SUN rises	SUN sets.	MOON rises.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	14 31 32	6 33	4 54	0 44	7 2	6 30	4 57	0 46	3 48	6 27	5 0	0 48
2	F	14 50 36	6 34	4 53	1 46	7 58	6 31	4 56	1 47	4 44	6 28	4 59	1 48
3	S	15 9 26	6 36	4 51	2 45	8 49	6 32	4 54	2 45	5 35	6 29	4 58	2 46
4	G	15 28 1	6 37	4 50	3 44	9 36	6 34	4 53	3 43	6 22	6 31	4 57	3 43
5	M	15 46 21	6 38	4 49	4 42	10 19	6 35	4 52	4 41	7 5	6 32	4 56	4 39
6	T	16 4 25	6 39	4 48	5 38	10 57	6 36	4 51	5 36	7 43	6 33	4 55	5 34
7	W	16 22 13	6 41	4 47	sets.	11 34	6 37	4 50	sets.	8 20	6 34	4 54	sets.
8	T	16 39 44	6 42	4 45	5 57	morn	6 38	4 49	6 1	9 2	6 35	4 53	6 4
9	F	16 56 59	6 43	4 44	6 38	0 16	6 40	4 48	6 41	9 43	6 36	4 52	6 46
10	S	17 13 56	6 44	4 43	7 24	0 57	6 41	4 47	7 28	10 22	6 37	4 51	7 32
11	G	17 30 36	6 46	4 42	8 11	1 36	6 42	4 46	8 15	11 2	6 38	4 50	8 19
12	M	17 46 57	6 47	4 41	9 4	2 16	6 43	4 45	9 8	11 47	6 39	4 49	9 12
13	T	18 3 0	6 48	4 40	10 0	3 1	6 44	4 44	10 3	morn	6 40	4 48	10 6
14	W	18 18 44	6 49	4 39	10 59	3 48	6 46	4 43	11 1	0 34	6 41	4 47	11 4
15	T	18 34 8	6 51	4 39	11 58	4 40	6 47	4 42	12 0	1 26	6 43	4 47	morn
16	F	18 49 13	6 52	4 38	morn	5 33	6 48	4 41	morn	2 19	6 44	4 46	0 1
17	S	19 35 7	6 53	4 37	1 1	6 32	6 49	4 40	1 2	3 18	6 45	4 45	1 2
18	G	19 18 21	6 54	4 36	2 8	7 31	6 50	4 39	2 8	4 17	6 46	4 44	2 8
19	M	19 32 24	6 56	4 35	3 15	8 30	6 51	4 39	3 14	5 16	6 47	4 44	3 13
20	T	19 46 6	6 57	4 34	4 25	9 29	6 53	4 38	4 23	6 15	6 48	4 43	4 22
21	W	19 59 26	6 58	4 34	5 37	10 24	6 54	4 38	5 35	7 10	6 49	4 43	5 32
22	T	20 12 24	6 59	4 33	rises.	11 16	6 55	4 37	rises.	8 2	6 50	4 42	rises.
23	F	20 25 0	7 0	4 32	6 21	ev.10	6 56	4 36	6 25	8 56	6 51	4 42	6 29
24	S	20 37 14	7 2	4 32	7 22	1 4	6 57	4 36	7 26	9 50	6 52	4 41	7 30
25	G	20 49 4	7 3	4 31	8 25	1 53	6 58	4 35	8 29	10 39	6 53	4 40	8 33
26	M	21 0 31	7 4	4 31	9 31	2 47	6 59	4 35	9 34	11 33	6 55	4 40	9 37
27	T	21 11 34	7 5	4 30	10 35	3 42	7 0	4 35	10 37	ev.28	6 56	4 40	10 39
28	W	21 22 13	7 6	4 30	11 39	4 37	7 2	4 34	11 40	1 23	6 57	4 40	11 41
29	T	21 32 28	7 7	4 30	morn	5 32	7 3	4 34	morn	2 18	6 58	4 39	morn
30	F	21 42 19	7 8	4 29	0 39	6 27	7 4	4 34	0 40	3 13	6 59	4 39	0 40

Leech Barometer.--Take an eight ounce phial, and put in it three gills of water, and place in it a healthy leech, changing the water in summer once a week, and in winter once in a fortnight, and it will most accurately prognosticate the weather. If the weather is to be fine, the leech lies motionless at the bottom of the glass and coiled together in a spiral form; if rain may be expected, it will creep up to the top of its lodgings and remain there till the weather is settled; if we are to have wind, it will move through its habitation with amazing swiftness, and seldom goes to rest till it begins to blow hard; if a remarkable storm of thunder and rain is to succeed, it will lodge for some days before almost continually out of the water, and discover great

12th MONTH. # DECEMBER, 1866. **31 DAYS.**

MOON'S PHASES.	D.	Boston. H. M.	New-York. H. M.	Washington H. M.	Sun on Merid. or noon mark. D.	H. M. S.
New Moon, ...	7	0 41 mo.	0 29 mo.	0 17 mo.	1	11 49 17
First Quarter, ...	14	11 59 ev.	11 47 ev.	11 35 ev.	9	11 52 39
Full Moon, ...	21	3 50 ev.	3 38 ev.	3 26 ev.	17	11 56 27
Third Quarter, ...	28	2 39 ev.	2 27 ev.	2 15 ev.	25	12 0 25

Day of Month.	Day of Week.	Sun's declens. S.	CALENDAR For Boston, New-England, N. York State, Michigan, Wisconsin, Iowa and Oregon.				CALENDAR For N. York City, Philadelphia, Conn., N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virg'a, Kent'y, Miss'ri, and California.		
			Sun rises	Sun sets.	Moon rises.	H. W. Bost.	Sun rises	Sun sets.	Moon rises.	H. W. N. Y.	Sun rises	Sun sets.	Moon rises.
		° ′ ″	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	S	21 51 44	7 10	4 29	1 38	7 20	7 5	4 34	1 37	4 6	7 0	4 39	1 37
2	G	22 0 45	7 11	4 29	2 36	8 11	7 6	4 33	2 35	4 57	7 1	4 39	2 34
3	M	22 9 20	7 12	4 28	3 33	9 1	7 7	4 33	3 31	5 47	7 2	4 38	3 30
4	T	22 17 29	7 13	4 28	4 29	6 47	7 8	4 33	4 27	6 33	7 2	4 38	4 24
5	W	22 25 12	7 14	4 28	5 25	10 29	7 9	4 32	5 22	7 15	7 3	4 38	5 19
6	T	22 32 30	7 15	4 28	sets.	11 9	7 10	4 32	sets.	7 55	7 4	4 38	sets.
7	F	22 39 20	7 16	4 28	5 21	11 50	7 11	4 32	5 25	8 36	7 5	4 38	5 29
8	S	22 45 44	7 17	4 28	6 8	morn	7 12	4 32	6 12	9 19	7 6	4 38	6 16
9	G	22 51 41	7 17	4 28	6 58	0 33	7 13	4 32	7 2	9 59	7 7	4 38	7 6
10	M	22 57 12	7 18	4 28	7 54	1 13	7 14	4 32	7 57	10 38	7 8	4 38	8 1
11	T	23 2 14	7 19	4 28	8 50	1 52	7 15	4 32	8 54	11 19	7 9	4 38	8 57
12	W	23 6 50	7 20	4 28	9 49	2 33	7 15	4 32	9 52	morn	7 9	4 39	9 54
13	T	23 10 58	7 21	4 28	10 50	3 20	7 16	4 33	10 51	0 6	7 10	4 39	10 53
14	F	23 14 38	7 22	4 28	11 53	4 8	7 16	4 33	11 53	0 54	7 11	4 39	11 54
15	S	23 17 50	7 22	4 29	morn	5 0	7 17	4 33	morn	1 46	7 12	4 39	morn
16	G	23 20 31	7 23	4 29	0 56	5 55	7 18	4 33	0 56	2 41	7 12	4 40	0 55
17	M	23 22 50	7 24	4 29	2 4	6 58	7 18	4 33	2 3	3 44	7 13	4 40	2 2
18	T	23 24 38	7 24	4 29	3 12	8 0	7 19	4 34	3 10	4 46	7 14	4 40	3 8
19	W	23 25 58	7 25	4 30	4 22	9 3	7 20	4 34	4 19	5 49	7 14	4 41	4 16
20	T	23 26 50	7 26	4 30	5 31	10 4	7 20	4 35	5 27	6 50	7 15	4 41	5 23
21	F	23 27 13	7 26	4 31	rises.	10 52	7 21	4 35	rises.	7 38	7 15	4 42	rises.
22	S	23 27 8	7 26	4 31	6 3	11 53	7 21	4 36	6 6	8 39	7 16	4 42	6 11
23	G	23 26 34	7 27	4 32	7 9	ev.48	7 22	4 37	7 12	9 34	7 16	4 43	7 16
24	M	23 25 32	7 27	4 32	8 19	1 36	7 22	4 37	8 21	10 22	7 17	4 43	8 24
25	T	23 24 2	7 28	4 33	9 23	2 25	7 23	4 38	9 25	11 11	7 17	4 44	9 26
26	W	23 22 4	7 28	4 33	10 28	3 14	7 23	4 39	10 29	12 0	7 17	4 44	10 29
27	T	23 19 38	7 28	4 34	11 28	4 3	7 23	4 39	11 28	ev.49	7 18	4 45	11 29
28	F	23 16 43	7 29	4 35	morn	4 55	7 23	4 40	morn	1 41	7 18	4 46	morn
29	S	23 13 21	7 29	4 36	0 28	5 47	7 24	4 40	0 27	2 33	7 18	4 47	0 27
30	G	23 9 30	7 29	4 37	1 26	6 39	7 24	4 41	1 25	3 25	7 19	4 47	1 23
31	M	23 5 11	7 30	4 37	2 22	7 32	7 24	4 42	2 20	4 18	7 19	4 48	2 18

uneasiness in violent throes and convulsive-like motions; in frost as in clear summer-like weather it lies constantly at the bottom; and in snow as in rainy weather pitches its dwelling in the very mouth of the phial. The top should be covered over with a piece of muslin.

A very Good Microscope may be made by dropping a little Balsam of Fir, or Canada Balsam, on the under side of a thin piece of glass. It may be used both before and after it is dry. A Microscope will be of material assistance in detecting the admixture of impure substances with articles of food. Even a common phial filled with water possesses a high magnifying power.

THE

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.

WORK IN ITS SEASON

FOR THE KITCHEN-GARDEN, FLOWER-GARDEN AND GREEN-HOUSE.

THE following hints are not intended as full directions, but as timely suggestions to assist in the performance of the various operations of the garden in their proper season, as delay or neglect from forgetfulness frequently leads to poor success or entire failure.

Work for January.

KITCHEN GARDEN.—Little can be done out of doors in the northern and middle states. Various preparations may, however, be made, which will essentially lessen labor and care, when active out-door operations commence.

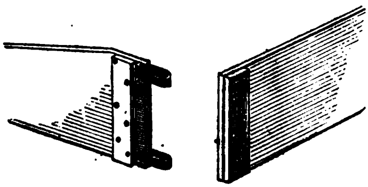


Fig. 2.—*Corners of hot-bed frames.*

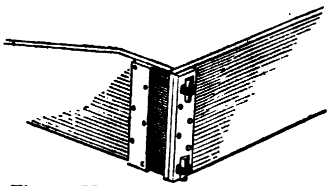


Fig. 3.—*Mode of connecting corners of hot-bed frames.*

Hot-bed frames (figs. 2 and 3) may be constructed or repaired. Nothing is better for the inside of the boards which come in contact with the earth than two or three good coatings of gas-tar, applied hot, when the boards are perfectly dry. It will preserve them from decay many times longer than if unprotected. The outside may be painted with common yellow ochre paint. If any glasses in the sash have been broken, replace them and secure any that are loose. Of the various substitutes for glass, such as varnished muslin, oiled paper, &c., none will compare to glass itself. Hand-glasses of various forms, may be now made ready for spring use. Fig. 4, is a hand-glass, made by sliding a pane of glass on each side of a double-sloped box, in tin grooves nailed on each edge, with a wire loop for handling and hanging up. Fig. 5, is a box hand-glass. Fig. 6, is a long hand-glass, for drills.

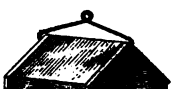


Fig. 4.

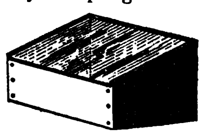


Fig. 5.

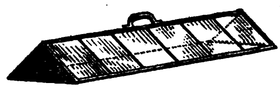


Fig. 6.

Procure or prepare bean-poles and various stakes, brush for peas, &c.; as the latter is most easily inserted by means of a good sharp dibbler, procure one or two of these tools. A blacksmith may manufacture one with a steel point, in a hollow, conical form, into which an old spade handle may be inserted, as shown in fig. 7. Bean-poles are best inserted in holes made with a crow-bar.

Fig. 7. *Dibbler.*

Manure.—As nothing is more important than a plenty of manure for successful kitchen-gardening, every means should be resorted to for an abundant supply. Thoroughly prepared compost is always best, and the beds may be commenced in winter. As long or fibrous manure can never be intermixed well with garden soil, it should be used only in such compost-heaps (figs. 8 and 9) as are to remain over summer. If spread in thin, alternate layers, with loam, peat, turf or leaf-mould, and the heap worked over and made fine, after laying several

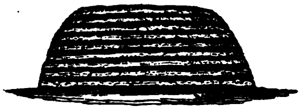


Fig. 8.—*Well made compost heap, with thin layers.*

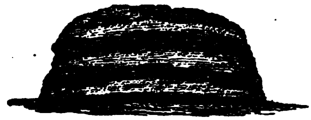


Fig. 9.—*Badly made compost heap, or with thick layers.*

months, it will then constitute an excellent enriching material. A sprinkling of fresh or leached ashes on each layer, as the heap is made up, will add to its value. Manure in a fresher state will answer well for many crops, provided no straw or long litter is used, and the manure is thoroughly and finely incorporated with the soil when applied. In this case it will be necessary to avoid the use of straw for litter (unless chopped short,) and use sawdust or leaves. A pile of strong, fresh manure should be reserved for early hot-beds.

If *Asparagus Beds* were not mulched or coated late in autumn, the work may still be performed. Its chief objects are to protect the plants and to furnish liquid manure for the roots, both of which accelerate the early growth of the shoots.

Seeds.—These should be procured as early as opportunity presents. Get the very best, from the most reliable sources. Never purchase seeds merely because they are cheap. Dishonest, tenth-rate dealers mix old and new seeds together, and it is difficult to detect the fraud. It is not economy to prepare ground in fine condition at much expense, and then grow poor vegetables, or lose a crop by the failure of seeds.

Flower Garden.—Cuttings may be prepared of hardy deciduous shrubs, and packed away in cellars, in boxes of damp moss. Hardy shrubs, set out in autumn may be mulched with manure; it will tend to protect the roots from cold, assist in enriching the soil, and prevent the ground from becoming hard and crusted in spring. In the middle states, where the ground is not frozen, beds for the spring planting of flowers may be cut in turf, and the excavation filled with enriching materials; and trenching, where necessary, may be performed. Marking sticks, rods for tying up flower stalks, and structures (figs. 10 and 11) for supporting climbers may be made.

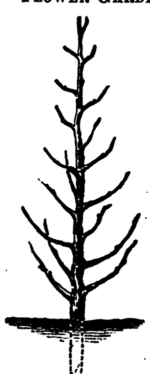


Fig. 10.—*Support for climbers.*

Fig. 11.—*Support for climbers, partly covered.*

Green-House.—As plants in the green-house, during this season of

the year, are mostly in a nearly dormant state, they need but very little watering. The soil may be examined, and if moderately or slightly moist, that is sufficient. The temperature should be about 45° or 50° in the day time, and 35° to 40° at night—never lower than 35°. Watch the thermometer sufficiently to prevent all danger of freezing. In very severe weather exterior matting must be resorted to.

Work for February.

KITCHEN-GARDEN.—Read the directions for last month, most of which will be applicable throughout the present month. Hot-beds for the early forcing of cabbage, tomato, egg-plants, &c., may be made in the middle states. Procure a supply of fresh manure for these, and old or decayed manure or compost for spring application to open ground. Composts, worked over and made fine, greatly exceed in value coarse and imperfect mixtures.

Hardy grapevines, currants and gooseberries may be pruned. Examine tools and see they are all in repair. Procure the very best, now that labor is so high priced—for a tool costing two dollars, and enabling a workman to do fifty cents more of labor per day, will pay for itself many times over during the season. Seed drills, and all implements for saving labor, should be procured.

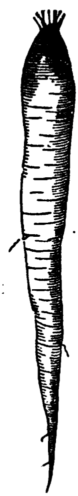


Fig. 12.

Seeds.—Observe the remarks under last month, and obtain the best selected seeds, from the most reliable sources. Plant but few varieties, and these the best—but a share of the new sorts may be placed on trial, on a small scale. Among the leading kinds the following varieties may be mentioned as worthy of planting for general crops. Figures and descriptions are given of several of these, to assist in identifying the varieties, and for preventing mistakes.*

Radish.—The Olive-shaped is the best early; the long scarlet (fig. 12) is the best for general crops. The Black Spanish is sown late, for winter use.

Beet.—The Bassano (fig. 13) is the best early variety; it is flat, somewhat like a flat turnip, but more ribbed, and varies from four to six inches in diameter. It is not suitable for long keeping, becoming coarse and fibrous. It is succeeded in a few days by the Early Turnip

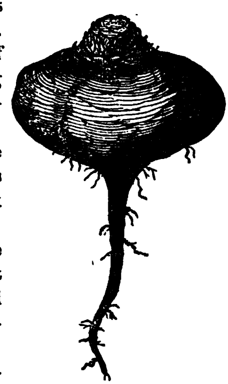


Fig. 13.

* For most of these figures, copied from BURR's "Vegetables of America," we are indebted to J. E. TILTON & Co., publishers, Boston.


Fig. 14.


Fig. 15.

Beet, (fig. 14,) which is better for long keeping, and is adapted to extensive cultivation. The Long Blood Beet is also an excellent beet for cultivation, and for late planting for winter use. Its long continued culture has led to much variation, and hence the importance of selecting seed and securing the best varieties. The improved Long Blood (fig. 15) is larger and longer than the common variety, sometimes extending to near two feet long. It is very dark in color, being nearly blackish-purple.


Fig. 16. *Well formed long Blood Beet.*


Fig. 17. *Badly formed beet, or poor sort.*

Turnip.—The Purple-top Strap-leaved, (fig. 18,) is one of the most valuable varieties. It is productive and excellent in quality, the flesh being clear, white, firm, rich and well flavored. The White Top Flat (fig. 19) is a medium size and uniformly white in color. The leaves are few and small, the flesh white, firm and well flavored. The White-top Strap-leaved is similar to the Purple-top Strap-leaved, but differing in color—both excellent in quality. The Yellow Malta is a handsome, small bulbed early variety, and is one of the best yellow turnips for summer use. The Yellow Stone is also an excellent variety.

Onions.—The Large Red Wethersfield (fig. 20) is of very large size, and, yielding heavy crops, is extensively cultivated. It is one of the best for keeping. It is often five inches in diameter, and three in depth; the skin is deep purplish red; the flesh purplish white. The Silver Skin Onion (fig. 21) is of medium size, with a skin silvery white; the flesh is white, fine grained and mild


Fig. 18.

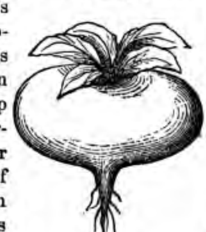


Fig. 19.

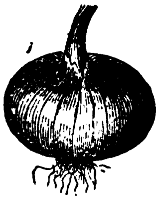


Fig. 20.

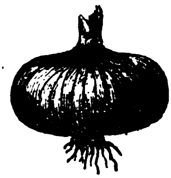


Fig. 21.

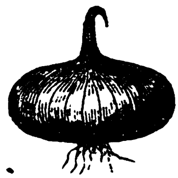


Fig. 22.

flavored. It is a poor keeper, which is its chief objection. It is, however, well adapted for sowing at the close of summer, for early use, or marketing in spring. The Yellow Onion (fig. 22) is an excellent variety, widely known and extensively cultivated. It is rather above medium in size, has a yellowish-brown skin and a nearly white, fine-grained and well-flavored flesh. The Danvers Onion is a sub-variety, greater in productiveness but not so good a keeper.

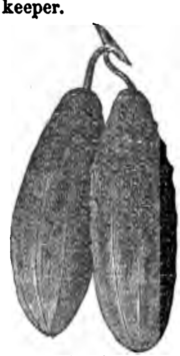


Fig. 23.

Cucumbers.—The early cluster, (fig. 23,) is small and very early. It is quite productive and a popular early garden sort, but is not adapted for pickling. The Early Frame is a few days later, and is a well known and a good sort. The Long Green is one of the best for general use.

Melons.—The Green Citron, (fig. 24,) is nearly round and regularly ribbed; in size medium or rather small, skin green and thickly netted; flesh green, very juicy, with a rich and sugary flavor. It is uniformly excellent, quite productive and is one of the most valuable varieties. The Large Netted Muskmelon, (fig. 25,) is large, oval, strongly ribbed, thickly netted, yellow; flesh yellow, thick and sweet, but not so juicy and melting as the last; hardy, and well adapted to common cultivation.

Fig. 24.

Watermelons. — The Black Spanish is large in size, roundish or oblong, somewhat ribbed, skin very dark green, flesh deep red, fine grained, sweet and excellent; seeds nearly black. The Carolina Watermelon is large, oblong, deep green, variegated with pale green; flesh granular, crisp, sweet, and of a good quality; seeds black. The

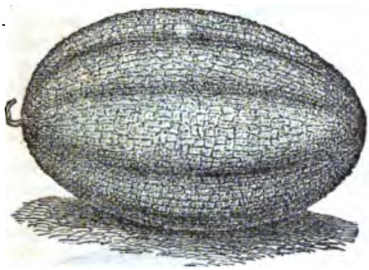


Fig. 25.—*Large Netted Muskmelon.*

Fig. 26.

Mountain Sweet watermelon is similar in form, but of a darker green; seeds brown.

Squashes.—Among the numerous varieties, the following rank as some of the best: Summer Crookneck, (fig. 26,) is bushy in habit; fruit medium in size, measuring about eight inches in length; bright yellow, warty. It is soft, and easily penetrated by the nail, when young and at a proper age for use. It afterwards becomes harder, and the flesh coarse and unfit for cooking. The Scalloped, (fig. 27,) is early, erect in growth, fruit somewhat hemispherical in form, deeply and regularly scalloped. It should

Fig. 27.

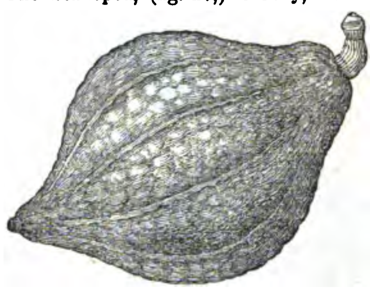


Fig. 28.

be used when not more than half grown. It is not quite so dry and sweet as the summer crookneck. The right time for using these two varieties is easily determined by piercing them with the finger nail. The Hubbard Squash, (fig. 28,) is an excellent variety, which has of late years become widely known for its excellent quality and long keeping. The form is an irregular oval, or somewhat like a double cone; surface knotty, dull green; flesh rich, yellow, fine grained, sweet, dry and excellent; keeps well through the winter, but is rather best when nearly fresh. Sweet Potato Squash, (fig. 29,) is somewhat similar to the Hubbard, but is larger and smoother,

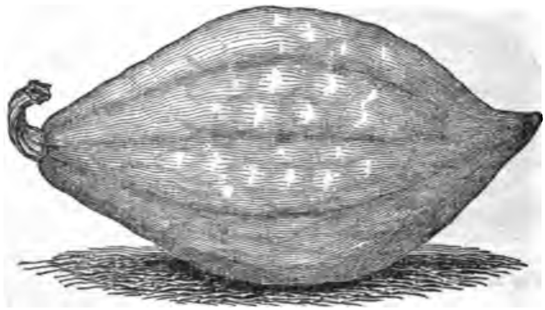


Fig. 29.

Fig. 30.

Fig. 31.

and the skin much lighter in color. The flesh is yellow, fine grained and sweet, nearly equal to the Hubbard. Winter Croockneck, (fig. 30,) is an old, widely-known sort, remarkable for its productiveness and ease of cultivation. It is quite variable is size, form and quality.

All these, as well as other varieties of the Squash, should be planted far away from each other. Two varieties in the same garden, even when planted at opposite sides, will become intermixed and deteriorate.

Cabbage.—The Early Sugar-loaf is the earliest variety, but must be used as soon as the heads become solid, as it will not keep long. It is immediately followed by the Early York, one of the oldest, most popular and best early sorts. The Winter Drumheads, of which there are several sub-varieties, are the best for winter use. The *Savoys* are distinct varieties; remarkable for their tender and delicate texture, but they do not head so compactly as the common sorts. The Green Globe Savoy, (fig. 31,) is one of the best and most commonly known. As it requires a long time to perfect its heads, it should be planted early, have rich soil and receive good cultivation. The Red Cabbage is desirable for pickling.

Peas.—One of the best early varieties is Landreth's Extra Early; which, however, quickly ripens its seed. The Eugenia is one of the finest of the new early sorts. The Champion of England and the Marrowfats are the best of the later varieties.

Flower Garden.—See directions for last month. Sticks, rods and structures for supporting flowers and climbers, being constantly exposed to moisture, should be protected from decay by paint. Avoid rendering them conspicuous by painting white; small rods may be green; larger structures appear much best if painted brown. To prevent decaying at joints, apply a thick coating of gas tar at those places when they are put together. Stakes, poles, &c., should be well coated with the same material, where they enter the ground.

Hardy shrubs may be pruned for the purpose of bringing them into symmetrical shape; if they grow too freely, cut off the longer leaders; if too feeble, thin out the flower spurs.

Green-House.—Follow the directions of last month in relation to temperature and watering. Plants beginning to grow will need more water, as they throw off a portion from their fresh leaves; but be careful not to overdo the matter. Keep both shrubs and plants, as soon as they commence growing, pinched into compact symmetrical shape, and avoid one-sided and long-stemmed growth. Remove decayed leaves and everything adverse to neatness; destroy insects by fumigation with tobacco and a solution of whale oil or soft soap. Re-pot or top-dress the soil where necessary.

Fig. 32.—*Badly trained green-house plant.*

Fig. 33.—*Well trained green-house plant.*

Work for March.

Kitchen Garden.—Open ground work can be performed only in the middle states, and towards the end of the month; and it is better to wait till danger from cold and freezing storms has passed.

Asparagus beds should be forked up the moment the frost leaves the ground, turning under the manure applied in autumn, and avoiding injury to the crowns or forming shoots. Pie-plant may be obtained early by covering each plant with a barrel open at top and bottom, and filling it loosely

with manure; the stalks will grow up through the manure and become large, blanched, tender and excellent. Early potatoes may be accelerated by placing the cut roots closely together in a hot-bed, and covering with a few inches of earth. Set these out when the sprouts have about reached the surface, and a week or two will be gained by the operation. If allowed more room in a hot-bed, they may be set out when two or three inches high; but in either case the transplanting should not be done so early as to cause danger from frost. Lettuce, sown in autumn, transplanted into the hot-bed, will come forward earlier than if sown there. The earliest peas may be planted as soon as the ground admits working.

Hot-beds in the northern states, for ordinary purposes, should not be made before the 20th. If made earlier, for prolonged forcing, they will need encasing in fresh manure before the old heap becomes spent.

Manure, if not spread in autumn, should be applied as early as practicable to open ground; and if the soil admits, worked in towards the close of the present month. Remember that manure thoroughly and finely intermixed with the soil is worth more than double such as is left in lumps or masses, or deeply spaded under in a single stratum.

FLOWER GARDEN.—New beds for planting annuals, herbaceous perennials and shrubs, if not made last autumn, should be made as early as the ground opens, that the enriching materials may become thoroughly diffused through the soil. Hardy perennials and bulbs should be divided and set out as soon as the soil will admit, as they commence growing early. Hardy shrubs may be transplanted at the same time, or afterwards. Be careful to spread out all the fine roots, and fill among them well with fine soil; cut the shoots back well, to give them a good form, and to cause a fine start. Sow annuals in hot-bed for early flowering.

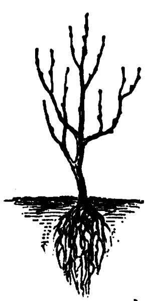


Fig. 34.—*Carelessly planted shrub.*

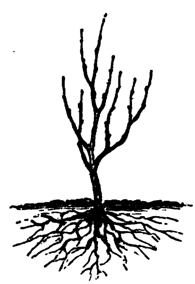


Fig. 35.—*Well planted shrub.*

Tender shrubs and plants, and half-hardy bulbs, which were covered with leaves or evergreens in winter, should have this covering gradually removed as warm weather approaches. Clear away all unnecessary litter, and keep the ground neat and clean.

Hardy roses should be pruned before the buds open, and enriching materials applied to the soil. The fresh start thus given them will furnish a finer and more copious bloom.

Box edging may be re-set towards the close of the month. If, as sometimes happens, the plants have grown tall and large, set them deeply in a

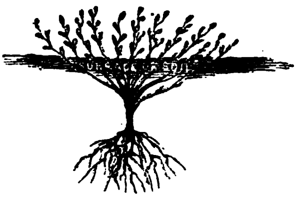


Fig. 36.—*Setting out box-edging.*

narrow trench, spread out the branches like a fan, (fig. 36,) and press the earth, as the trenches fill, compactly against them; then shear off the whole row nearly to the ground. These will all grow and leave no gaps.

New lawns should be sown heavily with suitable grass seed, (at the rate of two bushels or more per acre,) as early as the the ground can be prepared and properly mellowed. The seed will start early, and grow beyond the reach of summer drought, and being mown every week, will form a beautiful turf the same year. Lawns formed by sodding should be made very early, before the grass starts, and the turf laid closely and compactly so that there may be no crevices between the cut portions or beneath them.

Fig. 37.—*Badly laid turf.*

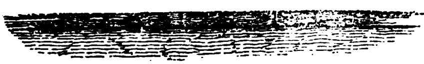


Fig. 38.—*Well laid turf.*

GREEN-HOUSE.—Air very freely in fine weather. Head back oranges or give them a proper shape. Give water more freely to plants in full growth. Remove all dead leaves, trimmings and rubbish, as well as dust, from the leaves, and moss or mould from the outside of the pots, and give the whole apartment a neat and fresh appearance. Carnations may be layered and fuchsias propagated by cuttings. Repot and prune plants.

These directions being for green-house plants only, (and not for those from tropical regions requiring a high heat,) the temperature should be continued moderate, or from 45° 60°.

Work for April.

KITCHEN GARDEN.—Cumplete the labors directed in last month and prepare the ground for early crops as soon as sufficiently dry. With heavy soils at least a week or two may be gained by underdraining; and sometimes the same excellent effect may be attained by the addition of sand from any source where it can be obtained. It will be observed that the application of sand has this great advantage over manuring,—it remains perpetually in the soil. In the northern states all the early garden crops may be planted soon after the opening of this month, if a good soil has been prepared. Hardy plants, such as parsnips, carrots, beets and onions, may be sown as early as the ground is fit for them. Those more sensitive to cold, such as beans, cucumbers and squashes, cannot be hurried by early planting; but only by forwarding in hot-beds, or starting under hand-glasses.

Asparagus should be transplanted very early or before the shoots appear.

It will continue longer and flourish better if two distinct beds are provided and shoots cut from them alternate seasons; a continued cutting from the same bed has a tendency to check the roots. The old practice of digging a pit three or four feet deep for asparagus, and filling it with a rich compost of manure and soil, is unnecessary—and induces planters to place the roots too closely together, in order to obtain all they can from the bed. The shoots will be larger and better if the plants are allowed plenty of room on a soil less than half as deep, with constant cultivation to keep the surface mellow. Asparagus beds covered with manure litter in autumn or winter, should have this forked in as soon as the soil thaws, avoiding injury to the crowns.

Hot-beds may be made in the northern states by the first of the month, and will prove useful in forwarding young cabbage, tomatoes, lettuce, radishes and cucumbers, as well as many other vegetables. Cucumbers and other plants which do not bear removal well, should be planted in pieces of inverted turf or in small pots.

In planting seeds it is important to observe a proper depth corresponding with the size of the seed. More injury is done by deep than by shallow planting; unless the work be postponed late in the season, when the soil is quite dry. We have known unskillful gardeners, for example, to cover beets two or three inches deep, very few of which come up, and the seedsmen denounced as a consequence. Seed from the same parcel covered scarcely an inch in depth came up copiously. Avoid superficial waterings of planted seed in dry weather, as it only serves to moisten and crust the surface.

As soon as young crops appear, keep the soil constantly mellowed to accelerate growth and destroy weeds.

In all instances never work a strong soil when wet or adhesive, whether for planting seeds or for cultivating it.

Flower Garden.—The first work is to clear away all rubbish and stalks of plants, straw, leaf or manure coverings, &c. The sooner that the beds for annual flowers can be prepared the better, in order that the compost mixed with the soil may become thoroughly incorporated. Seeds of very hardy plants which start readily or spring freely from self-sown seeds in autumn, may be sown early in spring. Others which germinate with more difficulty, should not be put in until later, or when the soil has become warm. Many seeds are lost and disappointment caused by planting them too soon.

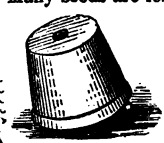


Fig. 39.

If the soil is too dry to start them readily, it may be kept moist for a few days by a covering of matting or sacking, and the young plants may be protected by placing over them a box or broad hoop stretched with thin muslin, or inverted flower pots, (fig. 39,) slightly propped up on the north side. Care must be observed in the depth of burying

the seed. Very small ones, such as the Portulacca, should not be half an inch deep, the moisture of the surface being preserved as above described.

Remember that the great secret of success in raising beautiful annual flowers is, 1. A good selection of sorts; 2dly. A good, well prepared soil; 3dly. Thinning out, so as to give plenty of room for each plant; and 4thly. Pinching in during growth, so as to form neat, symmetrical, densely blooming plants. Annual flowers which have been started in hot-beds, should not be set out before the end of the month or later.

Biennials and perennials sown a year ago should be reset, giving each plant sufficient room. Stools of perennials which have become large, and which it is desired to multiply, should be taken up and carefully pulled asunder, and replanted—doing the work very early, before growth has commenced. The growth of dahlias may be started in pots within doors.

Hyacinths shaded from the sun at the commencement of blooming, will be finer and continue longer.

Towards the end of the month care should be given to mellowing the soil in flower beds, especially in those occupied with perennials, were it is liable to become crusted.

Lawns should be sown as early in the spring as the ground can be prepared; and the seed very thickly sown, brushed, raked or rolled in. It will start more evenly and densely than if the sowing is done later, being careful to mow it at least once a month during the season.

Gravel-walks should be constantly kept in neat condition—nothing can make a flower garden appear well where the walks are neglected or left uneven or with ragged edges, or with irregular or angular border-lines. Let them form graceful curves and possess a neat, smooth, finished surface, and they will give character to almost any grounds they traverse.

Flower Beds and Edgings.—The modern practice, which is undoubtedly the best in every respect,—for economy, beauty and landscape effect,—of cutting circular, elliptical and arabesque beds in smooth turf, nearly obviates the necessity of forming edgings to these beds; hence the lessened demand for box edging and plants of a similar character. In some cases, however, such may be desirable, and if placed on lawns nothing perhaps is better than ornamental tile of a soft brown color made for this purpose, projecting but slightly above the surface. Edging made of growing plants is only applicable to beds which do not border on grass. Box, if well planted or started

Fig. 40.—*Flower Bed, cut in turf, with tile edging.*

Fig. 41.—*Section of Flower Bed, cut in turf.*

Fig. 42.—*Tile edging.*

and kept properly shorn down, forms a neat edging for a few years; but as it becomes older loses its fresh appearance and is liable to be killed in spots. The smaller species of iris form stout, vigorous edgings, easily kept within bounds. A neat and good edging is also formed of the Blue-eyed grass or *Sisyrinchium*, a native plant, growing frequently in wet meadows throughout the country.

Insects, as warm weather approaches, will begin to make their appearance. Use the usual appliances of tobacco-water, tobacco smoke, white hellebore, soap-suds, &c.

Green-House.—Accustom the plants to fresh air whenever the atmosphere outside becomes warm, lessening fire as the season advances, or keeping it up only at night. Place the hardiest plants nearest the draughts of fresh air. Water sufficiently such as are growing rapidly, and sparingly those more nearly in a dormant state. Syringe frequently. Apply liquid manure to feeble plants, and cut back old or stunted ones to start new shoots. Pinch back such as are freely growing, to give them symmetrical form. Give fresh soil where necessary, and keep the earth well loosened. Make cuttings of Verbenas, Petunias and Fuchsias.

Work for May.

Kitchen Garden.—Complete the work prescribed last month. Finish sowing hardy vegetables; and as soon as the soil becomes warm, plant beans, cucumbers, melons and squashes. Set out plants from hot-beds, and re-sow failures. Thin out plants where too thick, and constantly destroy all weeds on their first appearance. Insects will begin to multiply—one of the best remedies for them is a brood of young chickens which may be placed in any desired part of the garden, by confining the hen to a coop. The striped bug so destructive to cucumbers and squashes, may be destroyed by passing around twice a day and killing with thumb and finger; or they may be kept off by means of boxes covered with fine netting, (fig. 43.) Small cheese boxes, or even circular strawberry boxes answer a good purpose, being prepared similar to the circular shade for flower-seeds represented in the directions for last month.

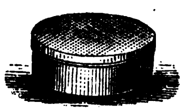


Fig. 43.

Keeping the surface of the soil constantly fine and mellow, will serve to retain a sufficient degree of moisture better than any watering.

Water-melons usually succeed best on light warm soils; but heavy soil may be made to produce them in great abundance by intermixing thoroughly a copious supply of fresh manure to a depth of twenty inches or more and several feet in breadth, raising the surface to a height of about one foot.

Among the best varieties of Sweet Corn, is Darling's Early, (fig. 44,) maturing quite early, producing little fodder and proving excellent in quality.

The Hill Corn, (fig. 45,) well known in some parts of Massachusetts, is a very productive 8-rowed yellow sort.

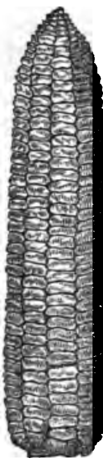


Fig. 44

A few special directions, familiar to experienced gardeners, but perhaps useful to others, may be briefly given:—Plant peas for succession—different varieties of squashes and melons which intermix, should be placed remote from each other—tomatoes transplanted from hot-beds, giving about four feet square for each plant, and if they grow luxuriantly, so as more than to cover this space, the soil has been too highly manured and they should be placed on land of less fertility—seeds of doubtful quality should be tested before sowing largely—insert poles for running beans before they are planted; the Lima will ripen best on the south side of a building or wall—long beets for the main crop may be sown towards the close of the month. The hand glasses mentioned in the directions for a former month, may be used for covering tender plants when frosty nights are feared.

Fig. 45.

Flower Garden.—Follow the directions given last month for preparing the ground and planting seed. Re-plant annuals from hot-beds, and thin out where too thick—a common reason why they do not grow and bloom well, is over crowding the surface. Shades or awnings placed on tulips will much prolong the blooming season. Early bulbs, when the leaves are dead, should be taken up and packed away, marking each sort accurately. Tall flower stalks likely to be broken down with wind, should be tied to neat stakes. Branching ornamentals, tending to grow tall and meagre, should be pinched back while growing, to give them a more compact form.

Keep gravel walks neatly dressed—mellow the surface of flower-beds—mow lawns once a week or oftener, and preserve a neat appearance in the whole grounds.

Bedding plants from green-houses may be set out during the latter part of the month, such as verbenas, salvias, pelargoniums, &c.

Care should be taken, in forming flower-beds, whether of annuals, hardy perennials or bedding plants, not to mix together those of dissimilar character, and especially those quite unlike in habit and height. Where flower-beds are cut in lawn, each entire bed should be occupied with the same plant so as to form masses of flowers, or with more than one if they are of the same height and bloom together. A succession of different sorts may be in

some instances obtained from the same bed,—for example, annuals transplanted after early bulbs, or between herbaceous perennials that grow upright and do not spread much laterally.

GREEN-HOUSE.—Most of the plants in pots may be removed to open ground before the close of the month. Skill may be exercised in arranging them so as to group well together, and the pots should be kept clean, and the plants in a neat condition. Many growing plants will need changing to larger pots. Those remaining in the green-house should be supplied with plenty of fresh air, which in warm weather may be given copiously.

Work for June.

KITCHEN GARDEN.—The chief points of attention during this month are constant tillage, and the destruction of weeds. There is no necessity that a single weed should grow in a well-managed garden—most gardeners being satisfied with destroying nineteen-twentieths and leaving the twentieth to grow and ripen seed. It would be well to destroy the latter as well as the others. Constant tillage tends to preserve moisture in hot weather, and to accelerate the growth of the plants. If labor is scarce provide the very best tools—which at a very slight increased cost, may double the effective work of the gardener.

Fig. 46.—*Hoop training Tomatoes.*

We have given, in former numbers of the Register, the mode of training tomatoes on a trellis. A convenient, simple and economical support may be made of narrow hoops, varying from a foot to eighteen inches in diameter, and secured to three stakes about four feet high, placed as shown in fig. 46. See Illustrated Annual Register for 1863, page 331, for raising tomatoes in barrels.

Plant for succession, peas, beans and sweet corn, and beets for winter crops. Set out celery and cabbages—the latter are effectually protected from the grub or cut-worm, by wrapping around the stem a small piece of writing paper, so that when set

out the paper may extend an inch or so above and below the surface of the soil. Dip the roots in thin mud before setting out, and they will need no shading from the sun. Watch for insects as directed last month.

Gooseberries may be easily kept for winter use if picked while yet green and hard—if nearer ripening they will spoil. Fill bottles full with them, cork them up dry, and place them in a cool and quite dark cellar.

Flower Garden.—Set out dahlias and complete the transplanting of bedding plants and hardy annuals. Short-lived flowering annuals may be sown late. Continue to take up bulbs as the leaves become dry, remove off-sets if any, and when the surface is dry remove and pack away. Stake tall flower-stems, and cut away and clear off dead stalks. Removing the flower buds from roses as soon as they form, will cause them to give a later or second crop. Removing seed-vessels before ripe will prolong the flowering of other plants. Gather ripe seeds.

Green-House.—Give plenty of air—carry out all but the tenderest plants—insert cuttings for propagation—make layers—wash foliage—mulch pots in open ground with mowings of lawn, to retain moisture.

Work for July.

Kitchen Garden.—Continue without intermission the hoeing and mellowing of the surface of the soil, and the destruction of weeds. Thin out crops where the plants crowd each other. The thinnings of beets may be used on the table and constitute excellent greens. Watch for insects as before. Save seeds as they ripen. Late crops of turnips may be sown before the close of the month. To prevent destruction by the turnip fly on adhesive soils, all the clods must be crushed, and the surface left even and mellow. Spreading old straw over the surface of such soil, burning it, and then sowing the turnips on the surface after a slight raking, ensures them success.

Flower Garden.—Continue to keep the surface of beds mellow and smooth, and every part of the grounds in neat condition. Layers of shrubs and plants may be made in open ground, such as roses, honeysuckles, verbenas, &c. Continue the pinching-back process to give a neat form to shrubs and plants. Tie up plants to stakes where necessary. Gather and mark seeds as they ripen.

Green-House.—Follow the directions of last month. Shade plants during hot days. Shrubs in a growing state, from which the bark separates freely, may be now budded. Cuttings for winter blooming may be inserted. Shrubs should be pruned and pinched in to give them a proper shape. Clear away all rubbish and keep everything in finished order. Secure a good supply of earth, compost and sand for potting.

Work for August.

Kitchen Garden.—Continue to carry on the work of previous months in cultivating the ground, and keeping it clear of weeds. Collect, put up

carefully, and mark seeds as they ripen. Sow winter radish and late crops of turnips. Earth up celery. Thin the fruit on melons, and remove those particularly which will not probably ripen. Do the same with tomatoes. Potato tops, as the crop is dug, should be buried beneath the soil, and all ground rendered vacant by the removal of any crop, cleared of rubbish and kept perfectly clean, if not replanted.

FLOWER GARDEN.—See the directions for last month. Sow bulbous-rooted plants to obtain new sorts; set out bulbs during this on next month, or even later. Stake dahlias as they need it, and pinch into form and thin out imperfect flowers. Herbaceous perennials, which have ceased flowering, and which often make a second growth in autumn, may be divided for increasing during the present dormant state.

GREEN-HOUSE.—Propagate succulent plants by slips, suckers, &c. Mellow the surface in pots and give fresh earth where needed. Bud oranges and lemons if the bark separates freely. Propagate pelargoniums by cuttings. Plants standing in pots dry more quickly than in beds, and if growing, should be therefore kept well watered. Procure peat, leaf-mould, sand, &c., for future use.

Work for September.

KITCHEN GARDEN.—Continue cultivation to all growing crops. Sow lettuce and spinach for wintering over, protecting in frames or with layers of evergreen boughs. Draining or trenching if unfinished, should be completed. Continue earthing up celery. Save seeds of all crops as they ripen, selecting from the largest when magnitude is an object, and those first ripened, where early maturity is sought. Mark them distinctly to prevent mistakes.

In preparing new gardens for next season's planting, or for enriching the soil of present ones, the sooner that manure is applied and mixed with the earth, the more time it will have to become thoroughly infused in every part. The present month is, therefore, a suitable time to apply fresh or old manure or compost, whether left on the surface or turned under.

FLOWER GARDEN.—Set out bulbs—divide perennials—continue to keep the ground mellow and clean, and to gather seeds. Dress and keep all parts of the ground in neat order. Lawns will require less frequent mowing than early in the season, but they should by no means be neglected, as a few straggling plants outstripping the rest, destroy the neatness of their appearance.

GREEN-HOUSE.—Give fresh earth and plenty of fresh air to plants which are returned under glass. See that all parts of the structure are in good repair, and that flues are ready for use. Transplant seedlings, cuttings, &c. Give less water as the weather becomes cooler and plants are retarded in growth. Before returning to the green-house, clean them of decayed leaves, and give them fresh earth.

Work for October.

Kitchen Garden.—Collecting and storing crops for winter will form an important part of the work for this month. All kinds of roots, such as potatoes, beets, carrots, &c., should be taken up without bruising, rendered perfectly clean, and the outside dried before carrying to the cellar. Those that wilt in drying may be kept in a fine fresh condition, easily accessible, by packing them in neat boxes, imbedded in fine damp moss. This is much better than sand, both in being cleaner and easier to reach. Cabbages in the head may be packed away and kept fresh in the same way. Cauliflowers which have not headed, should be planted closely together in a box of earth, and they will usually form good heads before spring. Clear away the dead stems from asparagus beds, and dress them with manure for winter. Manure ground which is not rich enough, by leaving it spread upon the surface till next spring, by which time the soluble parts will become finely diffused through the soil. Procure, and secure from freezing, a sufficient quantity of fine mould and sand for hot-beds next spring. Sow lettuce and spinach for spring use, as directed last month. The season of fresh tomatoes may be prolonged by covering them when night frosts are feared, if it be only with a sheet of muslin or a broad newspaper.

Flower Garden.—Clear away dead plants, stems and leaves, and keep the entire grounds in order. Finish setting out bulbs, hardy perennials and hardy shrubs. Peonies may be divided and set out. Rake up and save all scattered leaves and use them in compost heaps. In setting out hyacinth bulbs, place a handful of sand around each bulb, if the soil is clayey—which will tend to prevent rotting. Late in the month, cover them with a layer of leaves, or long manure,—to be removed in spring.

Green-House.—Give air and fire-heat, as both are respectively needed, and follow the directions of last month. Annual flower-seeds sown now will furnish a fine bloom in winter.

Work for November.

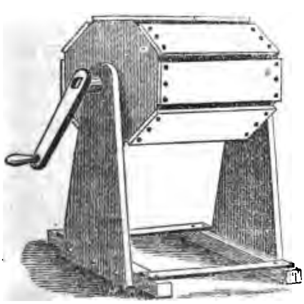


Fig. 47.—*Root Cleaner.*

Kitchen Garden.—As the season is rapidly drawing to a close, finish the gathering of crops early in the month, as directed for October. Roots may be rapidly cleaned by means of a revolving octagonal box, as shown in fig. 47. Slits or openings an inch wide, are left between the eight boards which form the eight sides. One of these sides runs in by sliding—by opening it, a half bushel or more of roots are thrown in, when a few revolutions of a crank, knock off all the loose earth, which falls down through

the openings. By using this cleaner, with the lower part running in water, roots are rapidly and perfectly washed.

Winter dress asparagus beds if not already done. Gather the heads of winter drumhead cabbage, and pack them in damp moss in boxes, as directed last month. Those which have not headed, may be kept and headed during winter for spring use, by the mode described on page 331 of the Illustrated Annual Register for 1863. (RURAL AFFAIRS, vol. III.)

FLOWER GARDEN.—Shelter, with a suitable covering of dry leaves, tender plants, such as auriculas and white day-lilies; also cover tender shrubs with evergreens. To prevent the settling of the leaves and smothering, first put on a layer of small evergreen boughs. Take up and secure dahlias. Finish planting hardy bulbs, if not completed, and set out hardy shrubs.

The following mode of obtaining a beautiful bloom of hyacinths for the parlor during winter, is given by a skillful cultivator of this flower—preparations for which should be made early the present month:—

First procure a handsome table made for the purpose, of black walnut with turned legs, so as to be an ornament to the parlor, about four and a half feet long by two feet wide in the clear, so as to hold three rows of eight pots each, the pot being eight inches in diameter. The top of the table is to be like a box or trough, eight or ten inches deep, made tight, and well coated with white lead paint inside, particularly at the joints. Into this table fit a zinc pan of the same depth, with wire handles turning down into the pan on each end. The table is then ready for the reception of the pots.

The pots are usually prepared towards the latter part of November, by taking eight inch soft baked pots and placing in the bottom about an inch of broken earthenware, charcoal or small pebbles, as may be most convenient. Then fill them to the top with a compost of equal parts of clean or washed sand, well rotted cow-manure and loam. An admixture of bone or horn shavings, although not essential, gives increased size and brilliancy to the flower. A bulb is placed in the centre of each pot, just so deep that its top may be seen, pressing the soil around it and watering it thoroughly. The pots are then set in a warm, dark cellar, and watered to prevent drying up. In about a month the pots will be full of roots, but the plants will not have grown more than an inch. They are then (about the middle or latter part of November,) placed in the pan, and the interstices filled with common wood moss—cover the tops of the pots smoothly with the handsomest green moss that can be found, through which the tips of the shoots will just be visible. Water copiously every morning through the fine rose of a watering pot on the moss. The water will collect in the bottom of the pan, and the roots finding their way out through the holes in the pots, will absorb it and grow rapidly. In a few weeks a beautiful dense bloom will be produced, the effect of which will be heightened by a tasteful intermixture of colors. A few narcissus, especially the polyanthus varieties, add much to the effect. The table should be placed in the strongest light. As soon

as a flower fades, it may be carefully lifted from the moss, the pot removed and a new one supplied from the cellar. The table may be of any size desired.

Cuttings of Shrubs should be cut with a small crown, as in fig. 48. They may be imbedded in sand, in dry trenches or pits, (fig. 49,) covered with earth and then with a coat of manure.

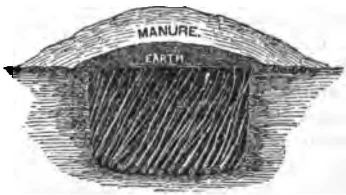


Fig. 49.—*Keeping Cuttings in Winter.*

Winter mulching of shrubs, for protection, should be applied towards the close of the month. (Fig. 50.) It should be spread broadly, or as far as the roots extend (*a*) and not merely at the foot of the stem, as too often done, and as shown at *b*, in the annexed cut.

Fig. 48.—*Cutting.*

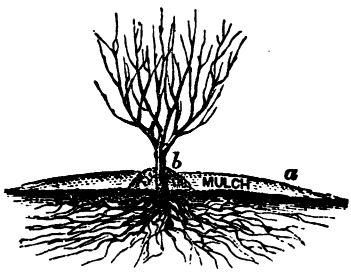


Fig. 50.—*Winter mulching shrubs.*

Green-House.—Plants recently removed from out-doors to the green-house, require more fresh air than afterwards, which should be admitted as far as practicable, according to the state of the weather. Moderate fire-heat should be applied when the weather is cold. A temperature of 45° Fah. is quite high enough for all strictly green-house plants. As they grow but little they should be watered quite moderately.

Work for December.

Kitchen Garden.—The labors of open ground management have closed for the northern states, but in the middle states the directions for last month may still be followed. All stakes, sticks and tools should be carefully housed and new ones made when required, on leisure days.

Flower Garden.—The only remaining out-door work is protecting tender plants and shrubs, if not already done, according to the directions given last month. The preparation of manure, its application to the soil, procuring labels, tools, seeds, &c., as directed for January, may be commenced during the present month.

Hyacinths in water for blooming during winter, are prepared by first selecting good, hard bulbs, without side-bulbs, placing them in glasses filled with rain-water, and then setting them in a warm, dark closet, taking care

that the water does not become foul or evaporate. Roots will be thrown out and partly fill the glass. Bring them out to strong light, as needed, and they will bloom in less than a month. A few drops of liquid ammonia will give higher color to the flowers. The water should be changed once in ten days, taking care that it has the same temperature.

GREEN-HOUSE.—See directions for last month. Give air as required. Keep the earth mellow in pots. Clear away dead leaves as they appear. A temperature of 358 to 458 Fah., is sufficient, but especial care should be taken that it does not run down to freezing point. The hardiest plants should be placed in the coolest parts of the house. If any should accidentally be touched with frost, water the whole plant from a fine rose with cold water. In severe weather apply mats, or close shutters.

WOODLAND AND THE TIMBER CROP.

At the present time, the preservation and growth of timber is more neglected than that of any other product of the land. We have treatises on the management of wheat, corn and other grain crops—on the best system of rotation—books are written on potatoes, turnips and carrots—every intelligent farmer supplies his shelves with works on cattle, sheep and horses—and every farmer, whether he reads or not, is familiar with the management of all these departments of husbandry. But not one land owner in a thousand is giving proper attention to the growth of young timber, to supply the deficiency which is now becoming strongly felt.

Twenty-five years ago, wood could be bought standing, in well settled portions of western New-York, and elsewhere, for one York shilling per cord—where now it would sell readily for at least twenty times as much. An estimate was made some years ago, that at the present rate of clearing, all the valuable timber trees east of the Mississippi, would be swept away within the next thirty years. It has been recently ascertained that the railroads of Ohio, consume annually twelve thousand acres of good wood-land, and in other states a similar amount is required. But all this is not equal to individual home consumption. A land owner who occupied a large house, pointed to a portion of his farm where one hundred acres had been cut in the last forty years for his own fuel. If there are three million farmers in the northern states, that commonly burn, wood, at the rate of twenty cords a year, they would clear off more than a million acres annually.

Where will all this present devastation land us? When our forests have gone, what shall we do for fencing—for timber for agricultural machines—

for railroad and other bridges—for the construction of canal boats, ships, and rail cars—and by no means least, for farm buildings and dwellings? Most obviously our only resource is to commence immediately the growth of young timber plantations.

We do not regret, as some do, to see the old forests melting away before the hand of civilization,—although the want of economy in the waste of wood is much to be regretted. We do not ask land owners to keep their old woods untouched. It does not pay. The owner of a forty acre wood lot refused, many years ago, an offer of forty dollars per acre; he sold it afterwards for one hundred dollars per acre—but this increase in price did not pay the interest and taxes in the interim. It is not advisable, therefore, to keep a large amount of dead capital in the shape of the original forests. A brief estimate will show that this is far less profitable, than to raise new timber and cut it away at a suitable age. By counting the annual rings in our forest trees, we find them to average mostly from one to two hundred years old, and to yield about fifty cords per acre. Calling the average period one hundred and fifty years, three years are required to grow a cord of wood. On similar land, occupied with well managed young timber, and cut once in about twenty years, an average amount of not less than two cords annually may be obtained—a product six times as great as to allow the trees a century and a half in growing. To cut only the old decaying trees out of the forest would yield a still less return. The best way, therefore, unquestionably is not the assiduous preservation of our old wood-lands, but a general and extensive planting of new timber.

There are other reasons why more attention should be given to the raising of forest trees. The face of the country is becoming denuded, and wintry winds and summer storms sweep our farms with more fury than formerly. Young plants of grass and winter grain, after heaving by frost, are beaten about and sometimes torn out by the action of the winds upon them. Grain crops and meadows are prostrated by tempests. Land owners who have planted belts of evergreens, have found that the protection they afford in this respect, has amounted on an average, to an increase in the crops raised within the range of their shelter, of about fifty per cent. more than where fully exposed. Belts of timber, therefore, traversing farms fully exposed to the winds, are profitable in two ways. First, by the increased amount of crops; and secondly, by the timber perpetually furnished by these belts. They should be placed at intervals of 60 to 80 rods. Where rising land faces prevailing winds, they should be nearer; but when the land falls, they may be more remote. The breadth of the belts, if evergreen, may be one or two rods wide; if deciduous, four or five rods. When cut one half in breadth may be taken at a time. (Fig. 1.) On small farms, one single belt, of such a width as may afford the necessary wood for use, judiciously located to protect the farm, may be sufficient; on large ones, they should be at regular intervals. In many cases, the borders of a gully or stream may

be selected as the place for the woods, where the wet or broken land would be of comparatively little value.

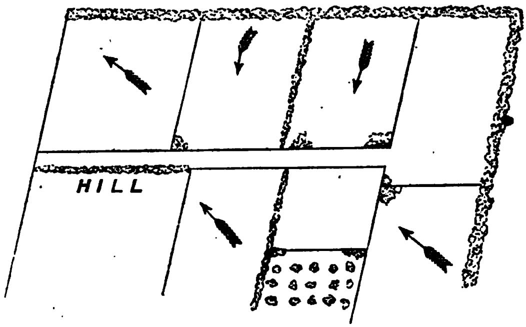


Fig. 1.—*Farm with Timber Screens—Arrows show the directions of two prevailing winds—the narrow screens are evergreens.*

The breadth of land thus protected will of course depend on the height of the trees. By leaving strips of the original forest, 70 or 80 feet high, the intervals may be double or triple the width required for young belts which have not attained a height of more than 20 or 30 feet. For this reason it may be best to plant them nearer together, and afterwards to remove alternate ones for timber.

By selecting thrifty growers, such as the Norway Spruce, (evergreen,) and the Scotch Larch, (deciduous,) a growth 25 to 30 feet high will be reached in about ten years, if they are properly cultivated; and fifty feet in twenty-five years. If planted closely, they spread less, and shoot up higher than if thin and spreading.

There are two distinct modes for the commencement and growth of timber plantations. One is the employment of the natural or spontaneous growth, springing up where old woods are cut off—either in the form of suckers, or young seedlings. The value of the future plantation depends much on the character and denseness of this young growth. To secure a good start the old trees should be entirely cleared away, and not as is often the case, merely thinned out, leaving the middle growth standing. For a few scattered trees will shade and greatly retard every thing below them. Every farmer is aware that no farm crop can thrive or become productive, if under the shade of thin woods. Young trees require the same advantages of air and sunshine as Indian corn; shaded trees are, therefore, found to grow only one-fourth or one-fifth as fast as those under a full exposure.

The young plantation having been started a few years, (cattle of course carefully excluded from it,) the first care needed is *thinning*. This is found to be as essential as the thinning of turnips, beets and carrots to the gar-

dener. If not attended to, the trees will crowd and enfeeble each other—many will be overshadowed and stunted—others will decay and die—and those which grow, will be irregular in form, (fig. 3.) and less valuable than the same number of trees where regular thinning has been practiced, and where the consequent growth is straight, thrifty and uniform. (Fig. 4.) The first thinning may be done when the trees are about large enough for hoop poles. The more feeble and crooked trees should be cut out, leaving the best and straightest as nearly at uniform distances as may be practicable. (Fig. 5.) The thinnings will usually much more than pay the labor; and if the young plantation happens to be a fine one, the hoop poles will more than pay the interest on the land. The first thinning may be at distances of about four and five feet; but should never be so severe that the shade and covering of fallen leaves will not entirely prevent the growth of grass—the leaves forming a mulch that protects the roots of the young trees, and pushes forward the timber. As the size increases, other and successive thinnings will be necessary. If the spaces are left nearly in straight lines, in one direction, (fig. 5.) they will allow the free passage of wagons for drawing out the cut trees. Various rules have been given for the distances in thinning; some have claimed that the distance asunder should be one-half the height

Fig. 2.—*The exterior of woodlands should not be trimmed to prevent winds sweeping through.*

Fig. 3.—*Unthinned plantations.*

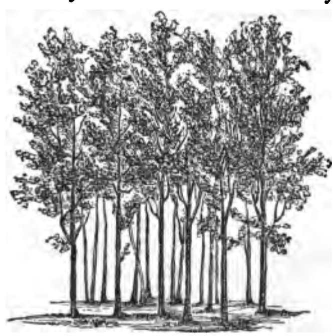


Fig. 4.—*Thinned plantations.*

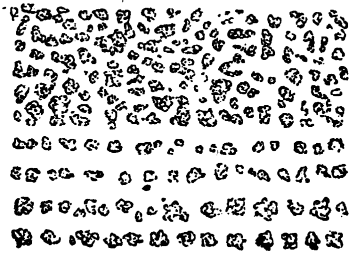


Fig. 5.—*Mode of thinning out natural plantations in rows.*

of deciduous trees, and one-third for evergreens. This is evidently allowing too much space, unless it be when the trees are very young, and are soon expected to double or triple their height. If too much sunlight is let in, it will cover the trunks with side branches, and render the timber knotty. (Figs. 6 and 7.) If the trees stand thickly together, they will run up tall and slender, and the trunks be nearly clear of knots; but if too numerous, they will retard each other, and yield a smaller product per acre. L. Bartlett, of New Hampshire, informed the writer of this article, some years ago, that he thinned out part of a piece of young wood-land, then 25 years old—the trees being seven or eight inches in diameter, and probably 40 feet high. This was all the thinning the plantation ever received; yet twenty-five years subsequently the thin portion was estimated at 33 per cent. more in value than the neglected part, and he had no

Fig. 6.—*Plantations too thin, limbed down the trunks.*

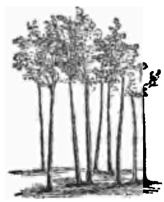


Fig. 7.—*Thick plantations have no limbs on the trunks.*

Fig. 8.—*Plantation of deciduous trees.*

Fig. 9.—*Plantation of evergreen trees.*

doubt that if the thinning had been continued, the timber thus obtained, would more than have paid the interest and taxes. The land was worth at first but ten dollars per acre—the owner had lately refused one hundred dollars per acre.

Artificial Plantations.—Seeds are sometimes sown successfully on newly cleared lands, the surface of which has been burnt over. This mode is attended with considerable uncertainty, and there is a liability that large vacant spots will be left. When it succeeds well the plantation should receive precisely the same treatment, as already described for a natural or spontaneous growth.

Besides this mode, there are two others—one, planting of the seeds in rows or "hills" where the trees are to remain; and the other, the trans-

planting of trees like a young orchard, but more closely together. Where the *seeds* are planted in rows or lines, it should be done on cultivated soil, and the young plants should be subjected to good cultivation for a few years. They may be planted like the hills of corn, at distances of four or five feet each way, and kept clean by horse cultivation. A number of seeds should be planted in each hill, and only two or three left, after the first year or two, by pulling up the weakest and most crooked. When as large as hoop poles, all should be cut away but one in each hill; and farther thinning may be done when they become as large as rails. During this period, they should be allowed to stand so near together, that the shade and the falling leaves may prevent the grass from growing. The only cultivation needed will be for the first few years, until sufficient shade is produced.

Another mode is to plant the seed in alternate rows, and alternate hills with corn or roots. A difficulty here arises. The seed of nearly all forest trees should be planted very early in spring, while the corn or root crop is planted several weeks later. To obviate this difficulty, the ground should be plowed in autumn, and the seed planted very early in spring, in rows eight or twelve feet apart, the plowing for the corn being done afterwards between these rows. The cultivation of all can be performed together; and other crops, such as potatoes, turnips and beans, occupy the space between the rows for a few years.

The former of these two methods is undoubtedly the best. The unimpeded cultivation which the young trees may receive, will cause them to grow with great rapidity, and where young timber is valuable (and it is likely to become so every where,) the profits will be large.

One prominent advantage in planting thus in rows, beside that of a regular and even, and consequently heavy product, is the facility with which wagons may pass between the rows for drawing out the timber—an advantage which will be well appreciated by those who know how difficult it is to drive a loaded wagon through the crooked paths in irregular woods.

Transplanting.—This mode is extensively adopted in Britain and other parts of Europe. The trees are raised in seed beds, removed to nursery rows, and afterwards set out in the plantations. They do not usually receive cultivation, and consequently do not grow fast at first. But being placed near together, or within four or five feet of each other, the surface is soon shaded and mulched, and the progress of the young trees is then more rapid. To assist in this result, fast growing trees of less value, are intermixed with slower growers, which produce the best timber. These fast growers, of which the larch is the most commonly used, are thinned or cut out in time to give the others a free chance. To prevent too great a check by removal, the young trees should not be more than three or four feet high when set out.

The best mode of placing the trees in these artificial plantations is in the form of the quincunx, or more properly the hexagonal mode, as shown in

fig. 10. Each tree stands at an equal distance from six others around it. They are thus more evenly distributed over the surface, and present a finer picturesque appearance on hillsides, than if distributed at right angles.

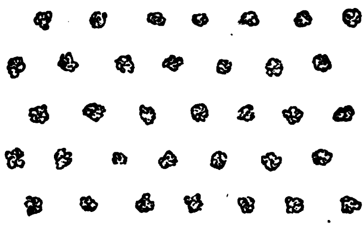


Fig. 10.—*Quincunx planting.*

Dry Seed a cause of failure in planting.—We often hear the remark made, "we have planted plenty of seed, but none of it has come up." This failure arises from the shell or outer coating of the seed becoming dry and hard before it is planted. The moisture cannot penetrate this dry shell, nor the swelling germ burst it open. This is particularly the case with the chestnut. To insure success, the seed as soon as it drops from the tree, and before the surface has lost it moisture, should be packed in moist mold or damp moss, until the time for planting. By observing this treatment towards all seeds of a similar character, perfect success will be the result, in connection with proper management in planting. The depth should vary with the size of the seed. Chestnuts may be planted nearly two inches deep—smaller seeds a correspondingly less depth. The common Locust (Robinia pseud-acacia,) will never germinate if the well ripened seeds are planted in the usual manner. They are hard and horny, and moisture at common temperatures will not penetrate them. The proper treatment is to pour boiling water on a pint or so at a time, and let it cool and stand several hours. A part of the seed will be found much swollen, and if now selected and planted, will readily vegetate. The remainder is to be treated again in the same manner, and so on till all the seeds are swollen. A sieve of the right degree of fineness will easily separate the swollen and unaffected seeds.

The product and value of artificial wood-lands.—Plantations of wood, raised in the manner already described, will be of much greater value than wild forests of a similar age. The most valuable species may be planted; or, if a young natural growth is selected, the best kinds and straightest trees are reserved at each successive thinning. The even distribution of the trees contributes to a heavier growth. Repeated experiments have shown that on poor lands a product may be obtained from well managed natural plantations, equivalent to one cord per acre annually; and on good land two cords yearly may be relied on. The period for clearing off in these instances varies from eighteen to twenty-five years. Artificial plantations set in rows with perfect regularity, and cultivated for a few years, at first would undoubtedly do quite as well or better, while the advantage of selecting the kind of trees most valuable in market, would be an important one. Take for example the common locust, single posts of which sell in many places for one dollar

each. Allowing the moderate estimate of one cord annually, and allowing fifty posts per cord, we should have a yearly result of fifty dollars for each acre. If the locust timber were worth only one-half this amount. it would afford a handsome interest on the cost of most of our country lands.

We close these remarks by a quotation from an excellent article on this subject, by Gov. HOLBROOK, of Vermont, published many years ago in THE CULTIVATOR, and which is worthy of again placing before our readers:—

Ten years ago, I cut the wood off a long stretch of side-hill, and in my inexperience, burnt over a portion of it for pasturage. The remainder was left to grow up again to wood. Many of the young trees are 6 to 8 inches through; they are all very straight and thrifty, and I value one acre of this land more than five acres of that which is in pasture. I shall not again permanently clear up my steep hill-sides.

At the solicitation of a railroad friend, a short time since, I accompanied him into the country directly south of this, to examine and estimate the value of some "wood-lots," I was forcibly struck with the amount of rugged, barren land, inaccessible for agricultural purposes, which had been thrown into open country, even by the present owners. Had a second growth of wood been permitted to run up on the land, instead of subjecting it to the burning and cropping process, it would have been now worth far more to the owners;—for a railroad is tapping that country, with its large and clamorous demands for wood and timber. Riding along with an old inhabitant of one of the towns visited, he pointed out a wood-lot which was cut over twenty years since, and suffered to grow up again to wood, contrary to the usual custom. It was sold at auction, a short time since, for $3,400. It would not have brought over $800, had it been in pasture from the time it was cleared.

Warm hill-sides, having an eastern or southern slope, send up a second growth of wood with great rapidity. Although they may not eventually, support so heavy a growth as strong level land, they will yet produce all the wood they are capable of sustaining, much sooner. A friend directed my attention the other day, to a tract of land, with an eastern slope, in a neighboring town, which was cleared of an original growth of wood, twenty-five years ago, and left to itself to produce another growth from the sprout. The land, with its present standing wood, was appraised a year or two since, at $50 an acre. Ten dollars an acre, is all that similar land, in pasture, in that vicinity, has ever been worth. By the application of a little arithmetic then, we find that the increase of this second growth of wood has been equal to 16 per cent. interest, per annum, on the worth of the land, without a dollar's expense for the cultivation,—that is, $10, at 16 per cent. simple interest, for 25 years, amounts to $40; to which add the principal, the worth of the land, and we have $50, the appraised present value per acre.

Several successful attempts have been made within my observation, in improving rugged and exhausted lands by planting them out to trees. Within

sight while writing, is a knoll that has been completely renovated by a plantation of the white locust. It was originally, a coarse worthless gravel, barren of herbage of any kind. I remember that the proprietor was laughed at by his neighbors for attempting to grow trees on his barren gravel. The locusts got root however, and although their growth was slow and feeble, they gradually formed a soil by the annual shedding of their leaves; and as the soil became thus strengthened, their growth became more vigorous, new shoots sprang up in all directions from the roots; and after awhile, clover and other grasses, began to appear on the open ground. I have been curious to observe the gradual improvement of this land. Last summer I noticed that the grass was very luxuriant, and would have yielded at the rate of a ton or more of hay to the acre, in the open spots. The locust wonderfully endows a poor soil with new energy and fertility. It seems to make its demands for nourishment more largely upon the atmosphere than any other tree, and gains foothold in soils absolutely barren of fertility. Then again, its leaves are small, with very rough edges, lying perfectly still where they fall, while those of most other trees are blown about by the winds, collecting in hollows or in large heaps.

In my notice of Mr. Rice's farming, last year, I remarked that he plowed up a large tract of unproductive hill-side, several years ago, and planted it with chestnuts. in rows four feet apart every way. The first sprouts coming up rather crooked and scrubby, he went over the field and cut them down close to the ground, which caused new sprouts to shoot up straight and vigorous. The trees are very thrifty, completely shade the ground, and grow more and more rapidly as the soil becomes strengthened by the annual deposit of leaves. So well satisfied is he with the experiment, that he is now placing other worthless lands in a similar course of improvement.

The late Hon. John Lowell, the first and most zealous advocate for improvements of this kind in New-England, planted three acres of waste land on his estate at Roxbury, Mass., to a variety of forest trees,—the whole value of the land not being $10 per annum.

In a communication upon the subject, he says, "The land was about half of it plowed and kept open with potatoes for two years, and then abandoned to the course of nature. The pines were taken up out of the forest with great care, not more than five feet high. Wherever I had the cupidity or impatience to introduce a larger tree, I either lost it or it became sickly. In some places I planted acorns, and as to my hard-wood forest trees, transplanted from the woods, finding they looked feeble and sickly when they shot out, I instantly sawed them off at the ground or near it. This required some resolution, but I have been abundantly paid for it.

"The result of this experiment is this, that in a period of from thirteen to fifteen years, I have raised a young, beautiful and thrifty plantation, comprising almost every variety of tree, which we have in Massachusetts, which are now from twenty-five to thirty-five feet high, and some of which, the

thriftiest white pines, actually measure from nine to twelve inches in diameter. The loppings and thinnings out of these trees, now furnish abundance of light fuel for summer use, and upon as accurate a calculation as I am able to make, I am convinced that the present growth, cut down at the expiration of 14 years from the time of planting, would amply pay for the land at the price it would have brought."

MUTTON SHEEP.

THE breeds of sheep existing in Great Britain from a remote period, and developed with the advancement of its agriculture by the skill of later flock-masters, are familiarly known among us as "MUTTON SHEEP," in contra-distinction from the various families of the *Merino*, which is primarily a Wool-producing animal. Thus, throughout the civilized world, there are few regions at the present day, to which either ENGLISH sheep or SPANISH sheep have not been carried, according as circumstances rendered the production of meat on the one hand, or of wool on the other, a leading consideration; and both by the perpetuation of these two great families unmixed, and by the intermingling of their blood with that of the sheep common in their new homes, the flocks of both hemispheres have been modified, and the demands of the great family of man, for articles of daily use in food and raiment, have from these sources derived a fuller and better supply than ever before.

MUTTON SHEEP AS COMPARED WITH FINE WOOLED SHEEP.

The Spanish sheep, as they serve the purpose better where the fleece alone possesses a marketable value, have been the more widely disseminated of the two. Where population is sparse and land unlimited, as in Texas, California, South America and Australia, their claims are unrivaled. And in countries more densely populated, where meat is less common as an article of

diet, and where the finest fabrics are largely manufactured to meet the wants of a luxurious aristocratic class, as well as for exportation to other countries, they also receive the lion's share of attention.

The English sheep, native to, and improved to their present degree of excellence in, a densely populated country, have found favor where an increased demand for mutton for popular use, and the higher farming of modern times, have rendered them both more directly profitable to the producer, and a more convenient adjunct in the culture and enrichment of his land.

But it is not to be forgotten, that while the primary excellence in each of these two great divisions of the race, lies in the direction above noted, the Merino is also a producer of mutton as well as of fleece, and the English sheep of wool as well as of meat. The flesh of the Merino, when bred for successive generations in a climate and on pasturage suitable for its development in size, and where the breeder has had in view this point of merit as well as that of wool, is such as to give it a claim upon the feeder on which some are disposed to place considerable stress at the present day. And at the same time, for many fabrics of the manufacturer, the wool of the English sheep takes a place which that of the Merino cannot supply; during the recent war we have seen the prices of long wools quite on a par at times with those of the finest grades, and fashion, with her powerful control over the customs and tastes of men, is daily extending the popularity for common wear of cloths of loose texture and often quite shaggy appearance, in the production of which the Merino has no part nor lot.*

The diversities of American agriculture are so great, arising both from extent of territory and natural differences, as well as those springing from a varying relative proportion between the population and the surface under culture,—that both of these great families of sheep are advantageously kept,—in some localities the one wholly superseding the other, while in some the claims of both seem so nearly balanced, that the farmer is at loss on which side the scale of profit is more likely to turn. From what has been already said, it will seem natural enough that the Merino should have first entered in to possess the ground. We had far more land than population. Beef and pork had been so cheap, and the latter so much the stock article in the meat diet of a large part of our people, that the carcase of the sheep was little regarded as compared with its wool. At the same time we were importing largely of foreign manufactures, and the wise desire of strength-

*The introduction of the alpaca or llama wool from Peru into Great Britain, for the manufacture of those fine, light gossamer stuffs in so much demand for ladies' use, and the subsequent discovery that imitations of the llama fabrics can be successfully made from the long Cotswold, Kent and Lincoln wools,—have also done much to increase the selling value of the latter as compared with short and fine wools. The market for fabrics of the description referred to seems unlimited, and the quantity of this style of wool produced, may undoubtedly be largely increased without danger of diminishing its price.

ening this branch of industry at home, led to public encouragement in various ways of fine wooled flocks. But as our population has increased, as greater care is given to the domestic animals of the farm, and as the taste for more and better mutton has grown, a new order of things has been gradually establishing itself, and the farmers of the country are by degrees coming to understand and meet this changed condition of affairs, by increased attention to the English sheep, although more slowly we have sometimes thought, than might have been reasonably anticipated from the amount of information diffused during the last score or two of years on the subject, and the amount of attention it has seemed to attract.

"It has been proved," says Mr. SANFORD HOWARD, in a recent article on the subject, "that a given quantity of meat can be produced from the sheep at as little, and in some cases less expense than from any other animal, and so far as can be ascertained, the meat is fully equal in nutritive properties. Here, then, we have from the sheep at least an equal amount of meat, as compared with any other animal, for the food consumed, while we obtain the fleece as clear gain." In the same article one point is alluded to, which we desire particularly to note in these preliminary remarks, namely, that "wherever the object in keeping sheep is the profit which *mutton and wool combined* will afford,—the essential requisites of food and shelter being provided,—some of the English breeds will be preferred to the Merino."

This statement is supported by the results of experience in Great Britain. It is an error to suppose that there is anything in the climate of that country which is unfavorable to the Merino, or that the prejudices of the English farmer are so strong as to preclude its introduction, if in the matter of profit it could enter the lists against the native breeds. On the contrary "some years ago, great efforts were made to establish the breed in that country; but although these efforts were supported by all the influence of royalty,—George III, 'the farmer king,' taking the lead in the enterprise, the breed did not obtain a permanent standing, and a few specimens only, kept merely as curiosities, are now to be found." One great obstacle to its success, even if its flesh was considered equal by most consumers to that of the English breeds, is the longer period it requires in reaching maturity, and its entire lack of adaptedness for the production of early lambs.

THE LONG AND SHORT WOOLED ENGLISH BREEDS.

Having thus endeavored, in as few words as possible, to show by a rough outline, the position of the English or mutton-producing sheep as compared with the Spanish branch of the race, it is our purpose to allude briefly to the characteristics of the different breeds of Mutton Sheep, and to some points in their practical management.

The English breeds may be classified with sufficient accuracy for our present object, in two divisions, commonly known as the Middle [or Short] Wooled and the Long Wooled breeds. The type of the former is the South Down—

of the latter the Leicester. The prize list of the Royal Agricultural Society of England, at the Warwick Show, at which the writer was present in 1859, included indeed but four divisions, viz.; 1. Leicesters; 2. South Downs; 3. Long wooled Sheep not Leicesters; 4. Short wooled Sheep not South Downs. The third division in this enumeration was composed almost wholly of Cotswolds, with one or two entries of Lincolnshires, &c. The fourth included Oxford, Shropshire, Hampshire and "West Country" Downs. In this list we have the chief breeds accessible to the American farmer.

Taking, then, the South Downs and Leicesters as the representatives of the two divisions, we find that the improvement due to human skill—in the one to the labors of Ellman, Webb and their compeers, and in the other to those of such men as Bakewell, in former times, and Sanday in our own,—has reached a perfection of form, an earliness of maturity and a capacity for fattening, unexampled in the previous history of the race. While the South Down bears the palm as regards quality of meat, either for early lambs, or when fully matured as mutton, the Leicester requires a shorter time to secure the latter, and both have had ardent advocates according to varying local conditions. Both have been extensively used in bringing other breeds, respectively similar in general character, into better shape for the farmer's purposes. Thus just as the Downs of Oxfordshire and Hampshire have been modified and improved by South Down blood, so the Lincolns and Cheviots have been benefitted by an infusion of the Leicester. The greater fineness, the superior symmetry, the increased precociousness secured by artificial care, have been imparted to the coarser, larger and less compact natives of other districts, and they in turn have given more size, and in some cases more constitution, prolificness and general utility to the new cross. And through what they have thus indirectly accomplished, as well as in themselves alone,. the South Downs and Leicesters have been the great improvers of English sheep.

How the English Farmer avails himself of the Pure Breeds.

To secure the highest development of a breed, whether of sheep or cattle or any other class of our domestic animals, there must be a sort of division of labor between those whose efforts are devoted exclusively to their improvement, and whose returns are derived from the sale or letting of the perfected animal, instead of the marketing of its merchantable products, on the one hand,—and, on the other, the practical farmer whose main business is with the latter, and for whose interest it is to avail himself in the most direct and least expensive manner of the improvements within his reach. As this article is intended for farmers rather than breeders, we need not pause to consider the principles on which the processes of the latter are based, but, taking the existence of improved flocks as they stand, show in what way they are made of immediate benefit to the agriculturist. Of course it is quite possible that a select breeding flock should be maintained by the same individual,

who also raises or feeds more or less animals for the butcher, but even then the two are quite distinct branches of farming.

Now in England, this has come to be so thoroughly understood, and the advantages of improved blood so universally recognized, that the best farmers almost invariably secure a well-bred male to put with the common ewes in raising either lambs or wethers for the market. "That sheep is the cheapest," says Mr. Henry Woods, in a recent lecture before the Wayland, Norfolk, Agricultural Association, "which will produce you the lamb that will pay the most money, whether you sell it or whether you graze it." After pointing out that the ewes to raise cross-breds from, should themselves be selected with greater care—a point on which there is more room for the exercise of judgment in England than here, owing to the better supply from which to make selections, he adds: "I am one of those who fancy that it is not ill-spent money to give an extra £5 for a ram." Without attempting to decide between the several breeds from which the ram may be selected, he gives his opinion as to the prominent points to be regarded in one to be used with short wooled ewes for raising cross-bred lambs, in the following language, which we venture slightly to condense:

"I have an idea that he ought to possess merits peculiar to himself; that is to say, he ought to have a good masculine countenance; he ought to have his neck neither too long nor too short, and placed upon his body as though it formed part and parcel of him. His breast ought to be well thrown out in front, and wide and expansive between his fore legs. There is one thing which is too often lost sight of in many pure breeds of sheep,—that is, the important point of the shoulders, so constructed as to have the right power of locomotion—not placed upon the body as though they were pieces of waxwork stuck on after the body had got cold. If we get the shoulders right, I like to have wide and expanded loins. I like the tail placed well upon the rump, and well surrounded with mutton; the backbone should be straight, but better a little arched than the other way. I like to see what I call 'legs of mutton,' deep, full and weighty. I do not want to see a ram too long upon the legs. A great and important point is that the wool is of the right character, and plenty of it; and that you get a skin not blue, but of that nice cherry hue, that every farmer acquainted with breeding, knows must propagate good stock and stock which will graze."

Making a Beginning.

One object with which we introduce the foregoing quotation, is to illustrate the fact that the best farmer is he whose judgment and experience enable him to decide in his own mind upon an ideal of the animal which will best suit the requirements of his farm, and the purposes for which it is to be bred; and then to select, with regard to quality, rather than price, from some established breed, the individual which, apart from the name or reputation of the breed, most nearly meets his own design. Comparatively very

few farmers, however, in this country, have had a sufficient opportunity of practice or observation with sheep, to do this entirely for themselves; and for these the only course is to form an opinion from the published descriptions of the various breeds, and then by prudent trials work their own way to a satisfactory result.

For the purpose of enabling the farmer to proceed less expensively, and perhaps more cautiously in this direction, the introduction here of the English practice of *hiring the use of pure-bred rams* by the season, is much to be desired. But the prices at which they can be *purchased* are not yet high, and it ought to be considered that even $50 expended for a well bred sire is reasonably sure to be returned in his first crop of lambs. There are three of the more important objects, either of which may be held especially in view by those engaged with Mutton Sheep:

I. The Raising of Market Lambs.

II. The Production of Wethers, &c. for Feeding.

III. The Feeding of Mutton Sheep for the Butcher.

I. Butchers' Lambs.—In the vicinity of good markets, there is perhaps no department of farming which offers, when judiciously managed, greater inducements than this. The general system employed is to purchase, from drovers or otherwise, common ewes, with care to obtain those not already in lamb. In ordinary seasons they may be had at a cost not to exceed $3 each, in early autumn. As already stated, a South Down ram is perhaps preferable to cross upon them. A vignette representing the head of a fine specimen of this breed, will be found at the commencement of this article, (p. 265,) from a sketch taken by Page, for the purpose, from the flock of Mr. Thorne of Duchess county.

In visiting Monmouth county, New Jersey, two or three years since, where some of the best South Down blood in the country has been introduced by Mr. Taylor of Holmdel, we found the production of butchers' lambs an important branch of farming. Mr. T. was led to his present position as a breeder, solely from his desire as a farmer to derive the most profit from this source, and in 1848 began experimenting with South Downs for the sake of obtaining the greater size and earlier maturity of their progeny. Not only are these points secured to the advantage of the breeder, but the purchaser finds a larger profit after paying a higher price, arising partly from the reputation of South Down lamb with his best customers, but also from the actually reduced proportion of offal, upon a given live weight, in comparison with other breeds of an equal or greater size. The experience of Mr. T. and his neighbors had shown, as prices ran before the war, that from six to seven dollars advance upon each ewe purchased in accordance with the above system, may be expected—say, perhaps, $4.50 for the lamb, $1 for advance on the ewe, and $1 for its wool. The best farmers feed the ewes for about three months, say with a half-pint daily of corn meal, together with their hay or cornstalks, but there are many who think good clover hay is quite

is quite sufficient without the meal. Some allow the lambs also to get at the meal, but the quantity they take when so young is not very great. They go out to grass, as soon as it furnishes a good bite, and are sold when the lambs are from 10 to 15 weeks old. The earliest lambs from a South Down cross will dress perhaps 50 to 55 lbs., but those sold at full three months old or over, ought to reach about 70 lbs. Lambs and ewes are sold together during the early summer, and before pasturage begins to be short; after which something of an interval may elapse before ewes are again purchased for the succeeding year. As to the figures above given, it may be added that the prices current during the last two or three seasons would probably add a considerable per centage to the return obtained, but we prefer to give the more moderate calculation based upon the values of preceding years.

This branch of farming is extensively followed in several counties bordering on the Hudson river, either alone or in connection with the raising of sheep and fattening of wethers.

II. THE PRODUCTION OF WETHERS.—Under this head we refer particularly to the raising and treatment of sheep destined to supply the market with mutton, leaving the consideration of *fattening* those raised by others, and purchased by the feeder, for the third point. As to the breeds to be selected we may give the following facts:

The writer of a prize essay published in the COUNTRY GENTLEMAN of 1865, states that extra fed sheep of the several breeds have been recorded as producing the subjoined weights of dressed meat and washed wool:—"Lincolns, carcass 350 lbs., fleece 28 lbs.; Cotswolds, 320 and 26; Leicesters, 250 and 22; Dorsets, 240 and 20; Oxford Downs, 240 and 18; Shropshire Downs, 220 and 16; Hampshire Downs, 200 and 12; South Downs 160 and 10. There have been individual cases of heavier weights, but not many." The first four of these breeds it will be seen belong to the "Long Wooled" division of Mutton Sheep, and the last four to the short or "Middle Wooled" division.

We condense from the same writer the following facts derived from the management of those who maintain flocks of their own, only buying or hiring rams from time to time, selling annually their wether sheep and cull ewes, and taking all the yearling ewes that are good into the flock in regular course. The system here described although applying generally to the Long wooled sheep, is mainly the result of experience with the Cotswolds.

"Cotswold ewes," says Mr. GARDNER, "are put to the ram about the latter end of September, and being good breeders will nearly all be in yean within one month; in fact it is customary to allow but a month, which brings them all to have their lambs conveniently together; it also weeds out bad breeders, for go on raising from females difficult to get with young, and when their progeny comes round the mischief will increase; whereas I have over and over proved that not one per cent. will miss the ram, and not one per cent. will die, if none but good breeders, and none but healthy ewes are bred from. Lambs are weaned about the latter end of June, and put to tur-

nips by the last of August, where they remain eating them on the land where grown, by having just as much ground given them daily as they will clear of turnips, consuming them at first, while young and tender, by eating off the tops and upper part of the bottoms in the morning, and by having the remainder of the bottoms pecked up with a small pecker for the purpose in the afternoon; but as the season advances, and the turnips get tougher, they are pulled, thrown in heaps, cut with a machine, and given in troughs three times per day; and should the tops, as is often the case, cause too much relaxation of the bowels, they are carted away and given to other kinds of stock. These turnips are used in this way till Swedes take their place, it being contrived for the former to last till about Christmas, when the latter, being much more fattening and forcing in severe weather, they are, as stated, substituted—having been previously put in heaps and covered with earth, and then used by opening as wanted, and cutting with the machine. By having a small quantity of hay given twice per day, these tegs, as they are now termed, will thrive very fast, and by good common attention and a little grain or other stimulant once per day in addition, I have known Cotswold tegs to weigh at one year old, 35 pounds per quarter of dressed mutton—not one or two only, but forty together. The ewe tegs are called theaves after they are shorn, holding that name till they have borne their first lamb and have lost their second fleece, when they are two-shear ewes, and are considered in their prime; they have one more lamb, and are sold either soon after the weaning of the second lamb for others to breed from another year, or are kept and made very heavy mutton at turnips the next winter. Thus the sales from a flock are annually half ewes and half wether tegs, and the wool from the whole. Though in all cases sheep should have only as much good food given them as they will clear up before they lie down, on no account should they stand waiting and *pining* for meals, as that is a check to growth and prosperity."

The accompanying vignette represents the head of a Cotswold ram, weighing over 400 lbs., shown at the Provincial Agricultural Society's Fair, at Hamilton, C. W., in the autumn of 1864, by F. W. Stone, Esq., of Guelph, from a sketch kindly furnished us by Page.

The author of another of the Country Gentleman prize essays on Mutton Sheep, was Mr. Jurian Winne of Albany county, whose experience has been mainly with the Leicesters, and whose directions are so full and explicit

that we shall quote them at considerable length. Mr. Winne, we may add, has been very successful both as a breeder and feeder, and we know of no one who can speak more directly from practical knowledge of the subject:

Selection of the Breeding Flock.—In selecting a flock of Long Wooled sheep, choose only nice straight even ewes, with a broad chest, a round barrel, broad across the hips, standing straight on their legs, &c. Let your ram also be perfect in all his parts—a small head, straight, and rather long ears, a lively, bright eye, broad across the shoulders and breast, straight and even across the back, round in the barrel, full in the hams, holding as near as possible the same width from shoulder to rump, and well wooled over and under, though not too close for mutton sheep.

If the flock is to be bred for mutton and wool only, it matters not much (for one cross, and *one cross only*) what the ewes are, provided they are not little Merinos; as I have had lambs that were dropped by small inferior ewes by a thorough-bred Leicester ram, able to compete, as far as weight and wool were concerned, with those from thorough-bred mothers. As illustrating this point, I recollect an instance in which I came into possession of a lamb got by my thorough-bred ram out of a small ewe, which, in good condition, would not weigh over 120 lbs., live weight; and this lamb, at one year old, sheared twelve pounds of clean, washed wool, and, at three years old, weighed 337 lbs., live weight, and dressed over 200 lbs. of mutton.

Management in Breeding.—The ewes should be in good feed for two or three weeks before putting the ram with them. Have the ram also in good thrifty order, feeding him for two or three weeks previously from one pint to one quart of oats, or oats and corn, or peas, per day. Tag the ewes, and do not leave the ram with them more than twelve hours out of the twenty-four. Keep both ram and ewes well through the winter by feeding not only hay, but also a few roots and a little grain if necessary every day.

Ticks.—Examine them and see if they have ticks, and if they have, get rid of them, for they will injure the sheep very much before spring, both in their wool and condition. If you have no better remedy, use a little Scotch snuff, or tobacco dust (which is much cheaper and just as effectual,) sprinkled in their wool—it will not injure them in any weather. If they have many, it will be necessary to repeat the sprinkling in two or three weeks, as then the progeny will have come out, and this will finish the insects for that winter.

Shelter, &c.—Treatment of Colds.—Have good sheds, with small yards attached for good weather, but do not allow them to get wet in cold weather under any circumstances, as one wetting to the skin, when it is cold, will reduce them more than you can replace by good feeding in two weeks. Give them plenty of clean bedding at least once a week, and oftener if necessary. Let them have access to pure water at all times, and have it, by all means, right in their yards. There should also be a box, with salt in one end of it, and salt and wood ashes in the other, in the yards, and *never suffered to get empty.* Feed occasionally a little browse, pine or hemlock; or, if this cannot easily be obtained, add a little rosin or nitre to their salt about once a fortnight. Smear their noses with tar at least three times in winter, and three times in summer—in summer immediately after shearing, as that will help to prevent their taking cold; about the first of August, as at that time, flies are very troublesome, and the tar will keep them away; and then again about the middle of October, which is about the time they should be tagged

and the ram put with them. In winter—when you bring them into the yards; again about the middle of January, and the third time, in March. And if any of them have foul noses at any time, put on the tar; and, if they have a cough, put some into their mouths also every few days, as this course of treatment, with me, soon results in cure.

Lambing Time.—Three or four weeks before lambing time, increase your grain and decrease your roots, as the latter in too large quantity, are apt to cause too large a flow of milk and injure the udder; while, with too little grain, the ewes are not strong enough at lambing. During the season of lambing, they should be watched very closely, and assisted a little—very carefully, however—if necessary. Be sure that the lamb nurses a little after an hour or two; and if the ewe, as is frequently the case with young mothers, is not disposed to let her lamb suckle, hold her a few times while the lamb is nursing, and this will generally remove all difficulty in the future. If lambs come in winter, the ewes should be in a dry, warm place, with plenty of clean litter.

Spring and Summer Treatment.—When the lambs are about four weeks old they are to be docked, and castrated if the latter is to be done at all, as at this age I never knew them to suffer in the least from the effects of it. Poor pasture and cold storms are ruinous to both sheep and lambs—therefore do not turn them out too early, and continue a little grain for ten or fifteen days after turning out, or until they have plenty of good pasturage. In summer they should have a field with plenty of running water, and a few shade trees if possible, and if it is a little hilly, so much the better. If the grass at any time scours either the sheep or lambs, tag them as soon as they are better of it, as such ones will sometimes get maggotty and die if neglected. About the middle of August wean the lambs, removing them as far as possible from their mothers, as both will quiet down much sooner if they cannot hear each other. The lambs should be put on the best feed attainable, and the ewes on the poorest; and, after a few days, examine the latter, and if their udders are hard or caked, milk them out and rub with a little sturgeon oil or arnica, either of which will not only soften the udder, but also dry up the milk. As soon as the ewes are all right in this respect put them on good feed again to recruit for winter.

Wintering the Lambs—Yearling Wethers.—Two or three wethers or dry ewes should be put with the lambs when they are weaned, to keep them tame; and, if the feed is not of first quality, give them daily a few oats, and the old ones will soon teach the lambs to eat the grain. About October 1st, separate the ram and ewe lambs, and keep them separate from that time until the next shearing, unless it is desired that the ewe lambs should breed, which I consider very bad policy, and never under any circumstances allow."

Continue feeding a little grain to the lambs all through the first winter, and until about shearing time, when it should be omitted altogether. After harvest such yearlings as are to be fattened the first winter may begin to receive a little grain; and I have found by experience that this is the most profitable time to prepare them for market, all things considered. When winter sets in, slowly increase the quantity until it reaches one quart per day for each sheep; and, with a good breed and good management, yearling wethers can be made, as I have repeatedly done, to weigh from 190 to 240 lbs. live weight, and dress from 100 to 140 lbs. of mutton before they reach two years old.

III. **Feeding Mutton Sheep.**—When the sheep to be fed are purchased, instead of being raised by the feeder, their proper selection becomes a matter of prime importance. The eye of the experienced feeder will go far in judging of the animal, but even this is sometimes at fault, and especially for those who have not had the advantage of long practice, other tests should not be overlooked. The sheep under examination should be handled as well as thoroughly scrutinized. And when they are purchased from droves, or at the live stock markets, with no knowledge of their previous treatment, there is danger lest the bad handling and harsh treatment they may have undergone, will require a long expenditure of food and care to bring them into good order for fattening kindly. The heavy sheep accustomed to shelter and little exercise, will not bear the hard driving, exposure, and crowding on the cars, to which they are often subjected, without great injury, even if they ever fully recover. And, as Mr. Winne's experience has shown, there is no mode of obtaining sheep to feed, as satisfactory and little open to risk of loss, as for the feeder himself to visit the breeders of whom he purchases, make his own selections at first hand, attend personally to their shipment home, and never lose sight of them until safely landed at their destination. If this task is entrusted to a third party, it should only be one upon whom the most entire dependance can be placed.

It is true that opportunities may often be had—indeed they must be the principal dependance, where personal selection as above recommended, is impracticable—of obtaining good sheep for feeding at the markets of our leading cities. There will sometimes be an overplus, and good animals which will well repay a month or two of careful treatment and liberal feeding, can be picked up by one near by, at really less than their actual value. Contiguity to such a market is an advantage of which those possessing it, seldom avail themselves as fully as they might. By establishing an understanding with the dealers, they may often be induced to notify a friend of the arrival of a good lot for purchase, and will then revert to the purchaser to replenish the supply when it happens to turn out short,—knowing, if his reputation as a feeder is good, that they may depend upon his yards for first-class mutton, and willing to give him the first chance when prices are taking an upward turn.

When the sheep reach the feeder's yards, Mr. Winne's recommendation, after resting them over night, is to smear their noses well with tar that they may throw off all cold or dust contracted during the journey. The purchase should then be properly sized, in lots according to size—say out of five hundred, one hundred of the largest and best to go upon the best of the fall pasture, and the hundred smallest and poorest for the lowest pasturage, when the remainder, which with proper care in purchasing, ought not to be very uneven, can be suited in lots to the other fields accessible. "Give them plenty of salt twice a week, and keep them on good pasture if possible, but if the pasturage gets short, as it frequently does by the first or middle of November, a little grain should be fed, beginning at the rate of one gill to each sheep per day of oats, or oats and corn, or peas, and increasing after the first week gradually up to one pint per day."

Having thus given them a start out of doors, the next thing is to get the yards and buildings in complete order for winter occupancy, instead of waiting till the snow has fallen, with the sheep standing and lying in it, and exposed to the storm for twenty-four hours or more, until the shelter is prepared. "If there is a saw mill near at hand," says Mr. W., "by hauling into the yards and stables four or five inches of sawdust, the stable floors will not only be saved, but the liquid manure from the sheep is also preserved, making a very valuable addition to the compost heap, especially for heavy land. As soon as the trees shed their foliage, rake and haul in on top of the sawdust, leaves to a depth of five or six inches more, and the two will together make plenty of bedding for at least four weeks, by stirring up the leaves a few times." A month's bedding may often thus be saved, which is a consideration when straw or other litter is scarce and high.

It is also well to take the feeding boxes out at leisure, and cleanse them by sprinkling the inside with slacked lime—thus removing all that greasy smell which there would otherwise be about them. Put them where needed, upside down, and when the snow comes, there will be nothing to do but turn them over, straighten them up, put in the feed, and let the sheep come. At least one tub or trough for water should be provided for each yard or shed, to be accessible to them at all hours of the day, and salt boxes, which Mr. W. thinks should contain salt at one end, and salt and wood ashes at the other, in the proportion of one part of ashes to two of salt.

Properly Regulating the Feed.—The following hints on this point are of considerable importance:

By feeding liberally with roots and not too much grain, during the first week at least, the change from green feed to dry will be less apt to affect the sheep. In feeding, unless a person can do it himself, which is very seldom the case, the feeder should be instructed with great care, how much grain is to go to each yard or stable according to the animals it contains. An overfeed at the commencement is almost sure to bring on the scours, and after they are over it will take at least two weeks' good feeding to put the sheep

back where they started from. My mode, to avoid mistakes, is to number my yards and stables, and count the sheep in each yard and stable—allowing to each sheep one-half pint of grain per day to start with, unless they have been fed grain previously, when I allow a little more. I then make out a schedule, thus: No. 1—60 sheep at one-half pint per day is 15 quarts, which divided in two feeds is 7½ quarts to a feed; so I write on the schedule "No. 1—60 sheep must have 7½ quarts at a feed morning and night"—No. 2 at the same rate according to number, and so on until I get them all. This paper is tacked up in the place where the feed is kept, and by going with the feeder a few times to show him and see that he makes no mistakes, if he is a good man he can do it as well as the farmer himself. As soon as the feed is to be increased, a new schedule is made out accordingly, and so on, until the sheep are fed one quart each per day, when I consider them on full feed, especially if the feed is corn, beans or oil meal, or a mixture of either. If oats or buckwheat compose part of their feed, they should have a little more.

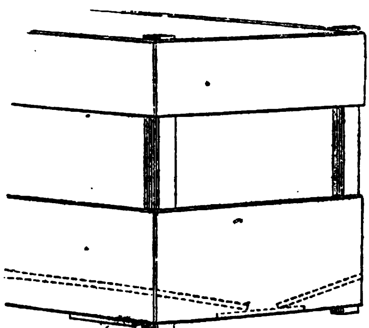
Regularity in Feeding.—Regularity of hours is very important. Sheep should not be fed one morning at five o'clock, the next at six, and the third at seven. The day I write, owing to the illness of one of the boys, I have had an example in point; on going out at five, a board was found off at the stable, and an end out of one of the feeding boxes. To replace these was a job of some time, and the grain only had been fed when the breakfast bell rang, leaving the sheep without their hay. I remarked to my man that this mishap would cost us "all the day's feed," which I verily believe to be the case. Our rule is this:

Grain and oil meal are fed at half-past five A. M. As soon as the grain is finished, hay is given—no more than the sheep will eat clean. The different yards and stables are carefully fed each day *in the same order*, which is important to avoid confusion and mistakes—beginning with No. 1, and so on through the list. After breakfast water is given, going around twice to see that all are well supplied. The roots are next cut (ruta bagas, which I consider best,) and of these to my present stock of about 350 sheep I am now feeding 10 bushels a day. At eleven o'clock straw is fed. Twelve is the dinner hour, and immediately after dinner the roots are fed. The troughs and tubs are now all examined, and replenished with water if necessary—also salt, salt and ashes, browse, litter, and anything else that may be needed, is supplied. The evening and next morning's feeds of grain and oil meal are next prepared, and hay got ready for both night and morning. At 4 P. M. feeding the grain is again commenced, followed as before by hay, after which the water tubs and troughs are emptied and turned over, and the work is finished for the night.

Avoid Disturbing the Sheep.—Never allow a stranger into the yards unless accompanied by the feeder, or some one familiar with the sheep. I have frequently known the approach of a stranger drive them pell-mell into and over their boxes, and the effects could plainly be seen with them for two or three days afterward.

The Stretches.—Should any of the sheep get the stretches, which they are apt to do when high fed, give a quid of tobacco half the size of a hen's egg, and if not relieved in twenty minutes, I give them a second dose; but nine times in ten the first dose cures. For stoppage in their water, I give one teaspoonful spirits nitre, with the same quantity spirits turpentine, in half a gill of luke-warm water.

Feeding Boxes.—The box for feeding used by Mr. Winne, is one that can be safely recommended for the purpose, although there are other kinds quite as likely to suit those who keep breeding flocks, or those of smaller sheep. It is simple, cheap, and easily filled and cleaned. Any boy who can saw a board and drive a nail or screw, can make one; all it requires is one scantling two by 3 inches, 15 feet long, and eight boards; it only has to be turned upside down and back again to clean it out, and as the feeder with his basket of grain or roots walks from one end to the other, scattering them along evenly in the box, twenty or twenty-five sheep according to size will follow in his rear and begin eating.—Moreover, there is a saving of hay, as they stand with their heads together working it into rather than out of the box, and Mr. W. thinks that in feeding 800 sheep last winter, 400 lbs. of hay would more than cover the entire quantity wasted and lost.



Description of the Feeding Box.—Feeding Box 12 or 14 ft. long, and 22 inches wide—the bottom slanting from both sides and resting on a board in the middle, forming a complete trough for grain or roots. The bottom side boards should be 11 or 12 inches wide—then a space left of 8 or 10 inches according to size of sheep—then the top boards, 8 inches wide—the ends and sides to match. Corner pieces of scantling in the inside, of hemlock or oak, as pine will not hold a nail or screw, the latter of which is preferable in putting them together.

Size of Sheds.—A shed 21 by 36 feet, with a narrow yard about eight feet wide on the southern side, will contain 75 good sized sheep. The open side should be provided with sliding boards to keep the sheep in when necessary. A board on the north side near the bottom may be hung on hinges to secure ventilation, and kept open except during very severe weather; for this is a most important point, and if properly attended to, the yard may be entirely dispensed with. We have seen at Mr. Winne's, 70 Leicesters thriving well in a lean-to 20 by 46 feet, with this provision of a ventilating board, and two trap doors of considerable size in the roof, opening and shutting at will. As to the space required by these sheep, ten superficial feet of shedding per head, may be regarded as about the proper room where a yard is at hand, or 12½ sq. ft. where there is no yard. To economize space, it is practicable to occupy a second story, if a bridge or inclined passage way can be conveniently provided—the sheep below having a yard, and those above, placed on a tight floor, securing sufficient air by the means here suggested. The average live weight of the sheep referred to in this calculation as to space, was about 150 lbs. per head.

Mr. PAGE has provided us with an illustration of the Leicester, which appears on page 275, from a ram in possession of SAMUEL CAMPBELL, of Oneida county.

Our limits will not admit of as full a description of the several breeds which have been referred to in the course of this article, as some readers might perhaps desire. Of the merits of either there is no doubt, and quite as much depends upon judicious selection, proper treatment, regular and well arranged feeding as to time, quantity, condition of the animal, &c., as upon the intrinsic characteristics of the breed chosen, provided only it be not glaringly out of place—bred or fed, for instance, where pasturage is so poor, other crops so light, and purchased food so expensive, that the cost of proper keeping outweighs all the profit obtained. No class of animals, when well kept, the manure husbanded and the soil enriched, will do so much to fertilize the farm.* Either of the Middle Wooled breeds, the South Down, or the Downs of Shropshire, Oxfordshire or Hampshire,—whichever is most readily accessible, of such excellence as to meet the ideal of the farmer proposing to buy, may be safely tested, if the preference is for the best mutton, not so great weight, delicious lamb, and the capacity possibly of greater exercise over the hills or upon shorter feed;—while on the other hand, if the Long Wools are preferred, with perhaps a still more rapid production of fat mutton, richer pastures and somewhat better protection, either Leicesters, Cotswolds or Lincolns, will not fail to give a good account of themselves in the end.

MUTTON SHEEP CROSSED WITH THE MERINO.

There is one point to which in conclusion we must allude, namely the fact that a cross may be successfully made between the English and Spanish breeds. The result is a larger frame and more meat with earlier maturity, on the latter, and a longer wool,—while the former receive something of the hardiness of the unforced Merino, will better withstand less careful treatment, and are made to yield a finer fleece, the price of which for Delaines and similar fabrics is often higher than that of any other wool in market. It is

* Mr. WINNE says: "As to the value of sheep manure, and the effects resulting from its liberal application, I have never kept much other stock, and I may be permitted to add, that twenty-seven years ago, when I came on to this farm, I cut from about 60 acres of land the first year 25 tons of hay. Year before last I cut from precisely the same number of acres, 100 tons, and last year (a season of severe drouth) 90 tons. When I begun on the farm I had one barn 32 by 40 feet, which held all the crops it produced. I now have one barn 44 by 52 feet, 20 feet posts; one shed 21 by 36, 18 feet posts; one 21 by 24, 16 feet posts; one 30 by 72, 18 feet posts, and one barrack that will hold 17 tons of hay. Summer before last they were *all full*. Two rules I laid down, never to lose sight of, when I commenced farming for myself: 1. To deal honorably with mother Earth—that is, to plow well, harrow well, give her all the manure I could, and never sell my straw, but keep it all for the land,—and I assure you I could soon see an improvement. 2. Never to buy anything (except manure) I could possibly do without, until I had the money to pay for it—for manure, when it could be had, I was never afraid to run in debt. These two rules I have strictly adhered to, and must attribute much of my success to their benign influence."

not a cross that we should commend unless in exceptional cases, and yet we have known instances in which much satisfaction has been expressed in trying it for a series of years. It is certainly not a cross that should be perpetuated by continued breeding on both sides from inter-bred parents; it is sometimes found to be the case, between different breeds, that a *first cross* retains in a remarkable degree the merits of both, and yields a really valuable product, while to carry it farther results only in disappointment and degeneracy.

MUTTON SHEEP AS WOOL PRODUCERS.

The fleece of the English sheep differs from that of the Merino in the absence from it, to a great degree, of the yolk and oil which make up so large a proportion of the weight of the latter. As to the amount of clean wool actually produced, there can be little room to doubt that the English sheep will compare favorably with the Merinos. But as sheep are supposed to consume food in proportion to their weight, and as the smaller the sheep the greater the proportionate surface,—where the mutton is of little or no value, of course the Merino has the preference. There is a lack of comparative trials between the two, however, going to establish the relative amounts of flesh and of wool, which a certain quantity of food expended on each, will return to the farmer. Mr. Page provides us with a vignette, that we may have the head of the Merino side by side with those of the

other breeds already represented,—from a ram in the flock of C. S. SWEET of Vermont. At the show of a State organization of Wool growers, held in Canandaigua, in the spring of 1865, a prize of $50 was offered for the fleece shorn on the grounds, which, after cleansing, should give the greatest weight of wool in proportion to time of growth and the live weight of the animal. Fourteen Merinos of different ages, and one yearling Cotswold ewe competed for this prize; and the committee having the trial in charge fulfilled their duties with the utmost caution, presenting in the end an elaborate report upon the result. According to the table accompanying this report, the Cotswold stood midway upon the list—seven Merinos somewhat exceeding it and seven others falling behind. The first seven Merinos averaged a production of 8 lbs. 3 oz. (within a small fraction,) for each 100 lbs. live

weight, per year; the Cotswold ewe, 7 lbs. 1¼ oz., and the seven poorer Merinos, 6 lbs., 6¾ oz. But it may be fairly claimed that even this view of the case, although by no means an unfavorable one for the Cotswold, is in point of fact unjust—being at fault in comparing the product of wool with the animal's weight at the *time of shearing*, and not with its mean or *average weight* during the year while the fleece was growing. It was impracticable of course to ascertain the precise weights of the competing sheep at the commencement of the year, from which data the mean weight of the whole time could be calculated. And among the Merinos by themselves, which may possibly be assumed to have increased in weight in about the same ratio, perhaps the result would not have been materially changed if this had been done. But in comparison with the Cotswold, which so much more rapidly takes on flesh, it becomes unfair to assume that the weights of the animals were respectively the same during the whole year as they were at its conclusion. The two year old Merino ewe which took the prize, weighed 49 lbs., and as she can hardly have weighed less than 25 lbs. at the beginning of the year, her mean weight would have been 37 lbs., and on this basis her production of wool was at the rate of not quite 12¾ lbs. to 100 of live weight. The Cotswold on the other hand, probably weighed no more than 5¼ lbs. one year before shearing, at which latter time its weight was 99¼—giving a mean weight for the year of 52 lbs. and a production of wool of 14 lbs. to the hundred; an amount exceeding even that of the prize Spanish sheep.*

We should not enter into this question at such length, were it not so desirable to call the attention of our farmers to the importance of experiments testing with minute exactness the question, whether, comparing English sheep with Spanish sheep, the former do, or do not, yield in reality the better return of the two for the food consumed, both in mutton and wool. One thing is certain, that the latter produce many pounds of a substance possessing no money value whatever, which is separated from their wool in the process of cleansing—the average loss of weight in scouring the 14 Merino fleeces shorn at Canandaigua, having been a small fraction over 8 lbs. per head. This loss, on the Cotswold, was only 1 lb. 9¼ oz.—making a difference of 6 lbs. 6¾ oz. loss greater on the Merinos than on the Cotswold, and that of a material, which, like the fat within the body, is probably produced at a much larger expenditure for food, than an equal weight of any other part of the animal structure.† [L. H. T.]

* This calculation was first made by Mr. Jos. Harris of the Genesee Farmer, whose figures we copy.

† The relative cost of equal weights of fat, of muscular tissue and bony structure, in the animal, is something which we know of no experiments to determine, and theoretically the above statement may or may not be strictly accurate. But Dr. Voelcker has shown that although animals have the power of forming fat from the starch, sugar and gum they eat, still they obtain it most readily and abundantly from the oily matters in their food. Now food rich in oily matters, like grain and oil cake, being much more expensive than hay and other materials deficient in this respect, it is practically true that fat costs more than muscle. To which we may add the query, whether a Merino was ever known to shear a "brag fleece," to wit, one composed of 65 to 75 per cent. of "yolk," which had not been fed to its utmost capacity with rich food?

IMPLEMENTS OF HORTICULTURE.

FLORAL RAKE, (fig. 1.)—This convenient little tool consists of a small six-tooth rake on one side and a hoe blade on the other. The handle is about fifteen inches in length, and it may be used with one hand while sitting on a stool at the flower bed. It is a very convenient tool for the use of ladies.

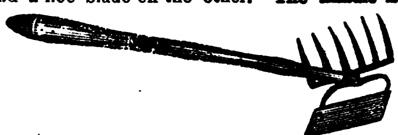


Fig. 1.—*Floral Rake.*

GARDEN FORK, (fig. 2.)—This is made of steel, and is used for loosening the earth in flower beds, and about the roots of plants. When the soil is sufficiently moist or adhesive, it answers a good purpose for transplanting annuals and small plants.

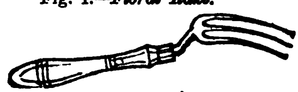
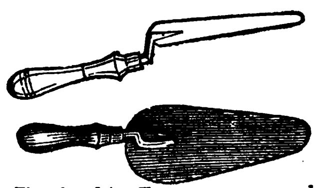


Fig. 2.—*Garden Fork.*

TRANSPLANTING TROWELS, (figs. 3 and 4.)—These are made of various forms and sizes, for transplanting, weeding, loosening soil on a small scale, &c. The concave ones are most commonly used for transplanting, cutting out blocks of soil in a circular form, but the flat ones are best for working the soil.



Figs. 3 and 4.—*Transplanting Trowels.*

VINE SCISSORS, (fig. 5.)—A neat and convenient instrument for thinning out the berries from bunches of grapes which have grown too thick, for removing unnecessary shoots, leaves, &c., and for gathering the fruit.

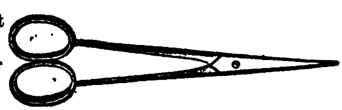


Fig. 5.—*Vine Scissors.*

FLOWER GATHERER, (fig. 6.)—This combines scissors with small pincers, and are not only useful in clipping the stalks of herbaceous flowers, but more especially so for roses and other plants furnished with spines and prickles. The scissors cut the stalk, and the pincers hold it till secured.

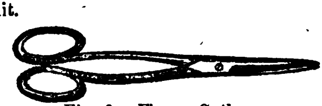


Fig. 6.—*Flower Gatherer.*

SHEARS FOR EDGING, (fig. 7.)—These are particularly applicable to trimming the sides of box and other edging to walks and flower-beds,—the operator standing upright while using them, and resting the shears on the wheel, while he thrusts them onward in shearing.

Grafting Chisel, (fig. 8.)—This is one of the best forms of the grafting chisel, combining the knife and wedge. The wide cutting part is used for making the cleft in the stock—the pointed ends for opening the cleft to receive the scions.

Fig. 7.—*Shears for Edging.*

Pruning and Budding Knives.—Fig. 9, is a very convenient knife for light pruning, sloping grafts, &c. Fig. 10, is the best form of the budding knife; the sharp edge of the blade being convex, allows the operator to make the upright slit in the bark, in places where it would be

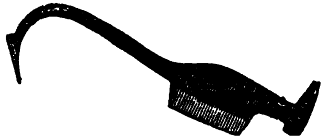


Fig. 8—*Grafting Chisel.*

Fig. 9.

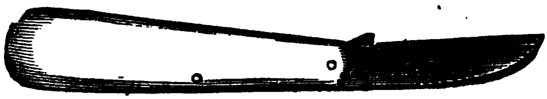


Fig. 10.

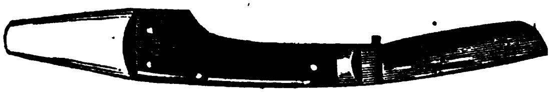


Fig. 11.

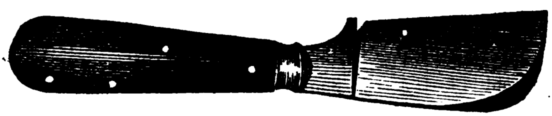
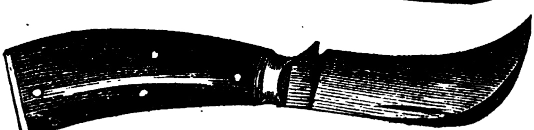


Fig. 12.



Pruning and Budding Knives.

hard to reach it with a common pointed knife, and without scraping or injuring the young wood. Figs. 11 and 12 are strong knives for pruning, the former for ordinary work, and the latter for removing small limbs, stubbing down stocks, &c.

Tree Scraper, (fig. 13.)—This is used for removing the rough and shaggy bark, moss, &c., from old fruit trees. It consists of a triangular plate of steel, attached to a handle at the center. The sides of the triangle are about four inches, and the handle may be from one to several feet in length.

Fig. 13.—*Tree Scraper.*

Garden Syringe, (fig. 14.)—This is made of various sizes, of different materials, and with different caps or orifices. The cheapest is made of thick sheet tin, and the best and most durable of brass. For throwing a single stream, the jet represented in the figure is attached; for washing dusty foliage with a soft shower, a rose with many fine holes is screwed on. The syringe is used for washing, watering, destroying insects, &c.

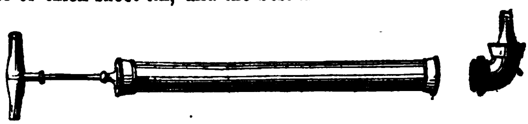


Fig. 14.—*Garden Syringe.*

Garden Engine, (fig. 15.)—This may be used for all the purposes of a syringe, in washing and watering plants, and also for washing windows, carriages, and protecting buildings against fire. It will hold about a barrel of water, and is easily moved by its handles on the cast-iron wheels. It will throw water 40 feet high.

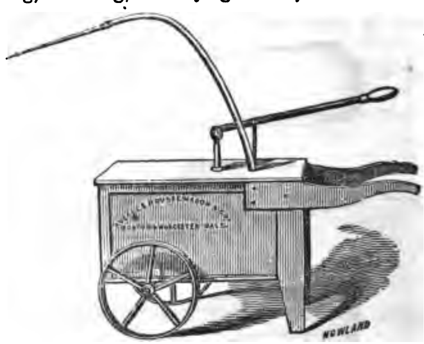


Fig. 15.—*Garden Engine.*

Wheel Barrows are of two kinds; fig. 16, is the simpler or canal barrow, used for wheeling earth, stones, and manure, and is emptied by tipping it on its side; and fig. 17, is the larger or box barrow, the side boards of which may be removed for unloading, or for receiving larger articles than would enter the box.

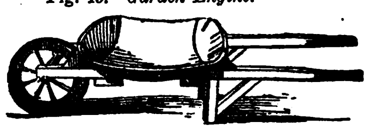


Fig. 16.

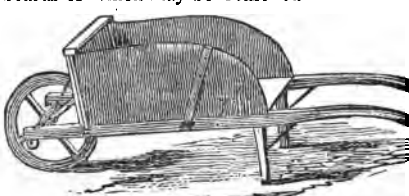


Fig. 17.

Garden Reel.—Fig. 18 represents the reel for the garden line, and stake for stretching the same, all made of iron. The stakes should

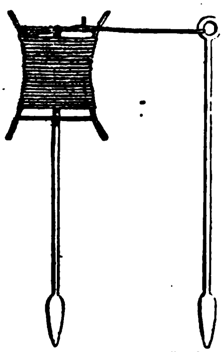


Fig. 18.—*Garden Reel.*

be at least a foot long. The line should be a strong well twisted hemp cord, about one-fifth of an inch in diameter, which, when not in use, is quickly wound up on the reel.

Seed Sower, (fig. 19.)—This is designed for sowing the seeds of various garden crops, opening the soil, dropping the seed, covering, and rolling, all at one operation. It lessons the labor of planting the early crops of vegetables.

Garden Seat.—Fig. 20 represents the end view of a garden seat so constructed that it may be instantly reversed when not in use, and protected from rain, dew, leaves, bird-slime, &c., and whenever needed is always clean and dry. The shaded part is the board legs or support, on which rests another board, (represented as lying flat, in the cut,) forming about one-half of the bottom of the seat. The rest of the bottom, and the back *b* is shown as turned up or inverted, forming a roof to the flat part; but when wanted for use, it is turned back by means of a hinge at *a*, and becomes a perfect seat with a back.

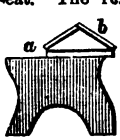


Fig. 20.

Fig. 19.—*Seed Sower.*

Rake for Seed Drills.—J. Harris of the Genesee Farmer, uses a convenient rake for forming rapidly and with perfect straightness, the drills for onions and other small garden seeds. The head of the rake is about seven feet long, and the teeth about one foot apart, (fig. 21.) A length of four or five feet would be less cumbersome, but operate more slowly. The first set of drills are made perfectly straight by running to a stretched line; and by running the first tooth in the last mark afterwards, the whole are kept equally so.—To drop the seed expeditiously into these drills, we have found the following mode a excellent one:—Provide a small tin cup like an inverted tin canister, with the bottom re-

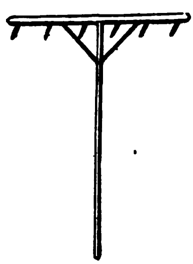


Fig. 21.—*Rake for Seed Drills.*

Fig. 22.

moved as shown in fig. 22. Several cups should be provided, fitting tightly on the lower end or funnel, with perforations of different sizes to suit different kinds of seed. Nail this cup to the lower end of a stick, about as long as a common walking cane, place the seed within the cup, and pass along the drills, shaking it over them. It will prevent stooping; and will enable the operator to walk rapidly.

PLAN OF A SHEEP BARN.

The following excellent plan and good management is from the pen of J. B. of Zanesville, Ohio, and is copied from a COUNTRY GENTLEMAN: I enclose with this, a plan of a barn I am about building on a farm of 122 acres—it is arranged especially for sheep. I have used one like it, (only it was 50 by 80 feet, and the rack partitions ran clear through,) for the past 16 years, wintering on an average 600 head of sheep in it, often times losing none, and but seldom a dozen, and they generally broken mouthed.

Fig. 1.—*Elevation.*

The plan enclosed is for a barn 50 by 60. It might be lengthened out the same way to a hundred or hundred and fifty feet. If the *ventilation* is good, I know that a thousand sheep can be kept under the same roof, as well as fifty.

It will be seen that the end of this barn is to the hill, and not the side. As it will have to be filled in some, to drive into, it is arranged for a cistern at each of those corners, with a root-cellar between, and *it* will have a trap-door above with door into the basement. There will be a lead pipe to convey the water from the cistern to the troughs; there will be small boxes about six inches square and six feet long, running down to where the pipe leaves the cistern, where the cock will be to let the water out when wanted.

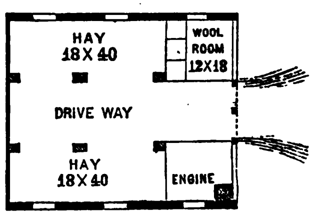


Fig. 2.—*Main Floor.*

The wall at the end that you enter above, is sloped off at both sides, and the dirt filled up against it, so that

the pipes are under ground till they reach the first trough, or rather above it for there will be a long trough on each side of the barn over the tops of the yard fences, (which are only three feet high,) and over each yard trough there will be a small hole in the long trough, and gutta percha pipes to take the water down to the drinking troughs.

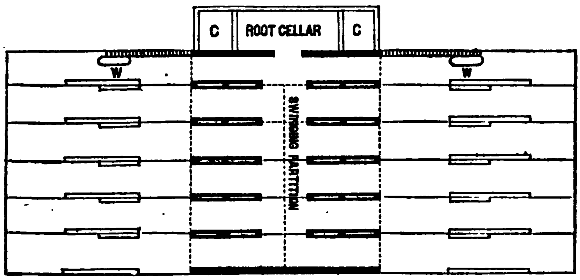


Fig. 3.—*Plan of Barn in centre, and yards each side.* C. C. Cisterns—W. W. Water troughs—5 ranges of racks in central part of barn, each division of which is 11 feet long—the yard grain troughs (longer,) and water troughs (shorter.)

The basement will be 9 feet high, and the *gates* at each side, 4 feet high, with swinging doors on the sill above. These doors should always be left open on both sides of the barn, unless during a rain or snow storm from the north, when they may be closed, leaving the south open; if from the south, close those, leaving the north side open. They never should both be closed at the same time, nor at any time unless a rain, hail, or snow storm; no matter how cold, I should leave both open. There should be ventilators built up, one by each of the four posts, seen in the main floor, and on the opposite sides of the holes for throwing down hay. The basement can be used for six flocks, or by putting in light doors swinging on the joist over head, it can be arranged for twelve flocks.

The main floor will be arranged on the left as you enter, for a four horse power, *Ericson engine, corn mill and root cutter;* on the opposite side a meal room and three bins, with outlets below, one for corn and cob meal, one for oats, and one for bran. The four bays will be used for hay and wheat.

Many farmers object to high barns, but when once you have your hay on one of these large forks, it is but little trouble to raise it a few feet higher. I have used one of these large forks for sixteen years, and have often unloaded a ton and a half of hay in four and a half minutes, and thrown it up to the top of the mow, in a barn with twenty feet posts.

Some may object to the number of gates, but I think you can never have a thing too convenient.

Now a little as to feeding and care of sheep. My custom is to keep their

yards and pens well littered with straw, and give them the range of the pens and yards at all times except during storms or while feeding, when the gate from the pen to the yard is closed, as the case may be.

At daylight they are shut up in their pens, and feed placed in their troughs in the yards, of one-third cob meal, one-third oats, and one-third bran, at the rate of *two bushels* of this mixture to the hundred. While they are eating this, their racks inside are filled with wheat or oat straw, the gates opened, water put into their troughs, and they can go in or out till four P. M., when they are fastened into their yards and their racks filled with hay; sometimes clover, and sometimes timothy, when the gates are opened and they can go in or out till morning, unless it is very cold or stormy, when they are fastened in. If any practical shepherd can improve on this plan I would like to hear from him.

EVERGREENS FOR PROTECTION.

Many land-owners, who have a more distinct appreciation of dollars and cents, than of the beauties of nature, cannot see the propriety of occupying ground and labor in setting out ornamental trees. To such, as well as to all others, we wish to urge the importance of planting evergreen trees as a shelter against the cold winds of winter. We once knew a country resident who flanked his house on the sides of prevailing winds with groups and masses of evergreens, (fig 1,) from the neighboring forests and borders of swamps—and drew upon himself pretty freely the jeers of his neighbors, for setting out trees that "bore nothing to eat," and were "only good to look at." In the course of years however, when these trees had attained a height of some twenty feet, and had afforded ample shelter from the winds that swept across the bleak hill occupied by his dwelling, the neighbors discovered that the place had become decidedly more comfortable in cold weather—also that many dollars in firewood were annually saved by the beautiful and efficient protection afforded. They began to see new charms in ornamental trees, and were disposed to adopt what they had once ridiculed.

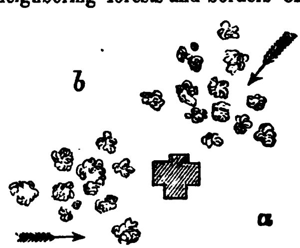


Fig. 1.—*Dwelling sheltered by trees—arrows direction of two most prevailing winds—a and b, open views towards the best distant points.*

Those who have cattle and sheep yards, exposed to the sweep of keen prevailing blasts, could they see the comfort which a screen of evergreens would impart, would be ready to plant them on the first opportunity. They

are the cheapest as well as one of the most permanent and durable kinds of shelter that can be provided.

Screens placed along straight boundaries, may be in right lines like hedges. But shelter in immediate proximity of dwellings, appears better if in scattered trees, groups, and irregular belts. (Fig. 2.) The straight screens may be made by setting the trees three or four feet apart, or at a greater distance—say eight or ten feet. In the former case, (fig. 3,) the screen will soonest become a dense barrier against the winds, but will not be so tall and stout ultimately. One of the best trees for this purpose is the Norway spruce—which, if planted three feet apart, will form a good and close shelter in five or six years, if well cultivated, eight or ten feet high, while the tops of the trees will extend some feet higher. If not cultivated, but allowed to grow up with grass or in hard ground, ten or twelve years will be required to attain the same dimensions. If the trees are placed six feet apart, (fig. 4.) they will in time make an excellent screen, and cost less at the start. They are untimately sheared or cut flat, so as to occupy less room—fig. 5.

Fig. 2.—*Irregular screen.*

Fig. 3.

Fig. 4.

Fig. 5.

Many erroneously suppose that if they set out large trees they will obtain a given height the soonest—a very mistaken opinion—for large trees receive the greatest check by removal, and they induce the planter to believe that he need not give good cultivation to his plantation. Smaller trees, well cultivated, will soon outstrip them, and present at the same time a handsome and more thrifty appearance. A height of two or three feet will, in most instances, prove most profitable. In the depth of winter—evergreens may often be removed from the borders of woods and swamps, if the earth is but slightly frozen. The protection which the trees as well as the coating of fallen leaves afford, often nearly prevent the mould which covers the soil from freezing, especially if snow has fallen before intensely cold weather set in. In such localities, select small trees, only a few feet high; cut a circle with the spade about the roots, so as to lift up a cake or ball of soil; place the trees in their natural position on a sled, and draw them to the place where they are to be planted. As a general rule, the cake of soil should be so large as to hold the trees upright without upsetting wherever they are placed. No evergreen, however difficult the kind may be to transplant successfully, will fail if this amount of earth is carried with its roots.

Trees from the nursery row cannot be removed in winter without great labor, at the same time that the work may be more readily done in spring, as they require the removal of less earth on the roots—they scarcely ever fail

if the roots are immediately immersed in mud as soon as they are taken up, and before the moisture on the surface of the roots has become dry.

The best wild growing trees for screens, are those which grow most rapidly—provided they answer well in other respects. The white (or Weymouth) pine is a fast grower, and is well suited for small groups and irregular screens, when several kinds are intermixed. Nothing makes a more beautiful straight screen than the Hemlock—either with or without cutting or shearing; it grows well in the shade, and, as a consequence, the interior of the hedge or tree is full of dense foliage instead of being hollow and bare within, as occurs with the Arbor vitæ and some others. The white cedar of Western New-York (American arbor vitæ,) grows with considerable rapidity, and makes a fine screen; but its surface should not be closely and evenly sheared, as this tends to make the interior hollow, but should be merely cut back irregularly with the knife. But, first and last, it must not be forgotten, that mellow cultivation not only doubles, at least, the speed of growth, but makes finer and more luxuriant looking trees.

One of the finest specimens of evergreen screens which we have ever seen is growing on the grounds of Ellwanger & Barry of Rochester. On a recent visit to their place, one of these screens presented so fine an appearance as to deserve special notice. It has now been planted about eight years, is eleven feet high, four feet thick at the bottom, and running up in the form of a wedge, and is as straight and even as a solid wall of masonry. Such a screen, extending around a garden, would protect it from cold blasts, and probably be equal to two or three degrees of latitude in softening the severity of the climate. The Norway Spruce like the Hemlock, grows well in the shade, and this screen seemed nearly a solid mass of verdure throughout its interior. The Hemlock screens presented the same appearance when examined inside. But the Arbor vitæ, Buchthorn, &c., which do not grow well in the shade, always exhibit nothing but bare stems and branches inside, however dense the foliage may be without.

Laying out Curves for Roads and Walks.

There are two prominent reasons why roads and walks should be laid in in curves; the first is utility, and the second is beauty. Unless the surface of the country is perfectly level, a public road should vary from the straight line, in order to avoid the ascent of hills. Unfortunately, in many places, this has not been properly attended to. We could point out a number of instances where a slight deviation from the right line in a public highway, would have prevented the necessity for every carriage and loaded wagon ascending a steep hill. In one case, familiar to us, the ascent is ninety feet from the level; a deviation of twenty rods, with a lengthening of the road

of not more than five rods, would have entirely avoided the hill. Ffty teams on an average pass this hill daily, making 15,000 laborious ascents annually, simply because the man who laid out the road did not exercise a few minutes' thought. Several years ago a turnpike road was made from Worcester to Boston, three miles shorter than the old road, but passing over instead of avoiding the hills. But very few travelled it—they preferred the longer and leveller route, and the enterprise proved a failure. A humbler illustration occurred on the farm of an acquaintance who made a smooth farm and cattle road over an ascent, but leaving a portion of the enclosed space more nearly a level. His cattle soon found out by practice that more exertion is required to overcome gravitation in walking up and down the hill than by passing on the rougher surface around it; they therefore selected a path for themselves very nearly on a level, and where a skillful engineer would have placed it, and after a while wore it smooth by frequent passing.

In a hilly or undulating country nothing of the kind can be more agreeable than the constant deviation to the right or left, in graceful curves, on a nearly level, well-laid out and well-constructed road. On the other hand, travellers have often remarked on the tiresome sameness of a long, straight road over level country.

In laying out ornamental grounds this remark applies with greater force. Straight walks have a stiffness entirely discordant with the beautiful and curved forms of nature, and the old geometric school has consequently given place to the modern, more natural, and more graceful style.

A well-laid out and smoothly-kept walk will impart character and finish to any grounds, even if the rest is in rough condition. But a badly curved, broken-jointed, ill-dressed walk will spoil the appearance of the finest landscape garden in other respects.

Novices are often puzzled for definite rules for making curves. In the simpler cases it may not be necessary to draw plans on paper; but where this is done the work may nearly always be accomplished in a better manner. A well-drawn design is transferred to the grounds by measuring the several parts. But still it is desirable, in finishing the details, to adopt some rule for making true and easy curves. The best mode is to provide a large number of short wooden pegs and stick them in the ground, at regular distances, deviating from the straight line a greater or less degree according to the length or shortness of the curve. Fig. 1 exhibits this process where the successive and regular deviations form the curved line desired. At *c* these deviations are slight and the curve is longer; at *b* they are greater and produce a shorter and more abrupt curve. A perfect circle may be laid out in this way without the usual resort to a line and centre-pin, fig. 2. A land surveyor may thus run a circle miles in diameter by successive and uniform deviations at each observation taken at regular distances.

We have found the following contrivance a simple one, and to answer a good purpose. Take a light wooden rod, (fig. 3,) say two yards long, with a

small wire hook at one end, a slight notch on each side at the middle, and a graduated cross-bar at the other end.

Small holes are bored into this cross-bar at regular distances, for the insertion of a pin. Suppose we wish to lay out a walk, as shown in fig. 1, commencing with the direction *a. e.* Place the rod just described *a. d.* in this direction, and stick in a pin at *a.* and at *e.* The deviation of the third pin at *d.* can be accurately determined by making a few trials. When thus determined, set the pin in one of the holes of the cross-bar at the determined distance from the centre, and insert a corresponding pin into the ground. Then slide the rod a yard forward, placing it against the two last pins and repeat the process. So long as this process is continued it will form a uniform and perfect curve. If, however, it is desired to pass gradually from a long to a short curve, remove the pin in the cross-bar further from the centre at each successive station, and the result will be shown at *c.* and *b.* in figs. 1 and 4.

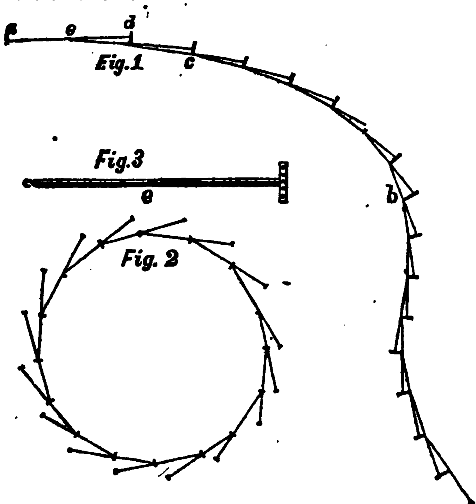


Fig. 1

Fig. 3

Fig. 2

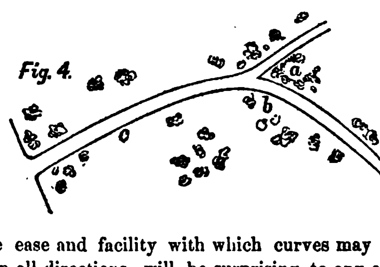


Fig. 4.

After some experience, the ease and facility with which curves may be thus extended over grounds in all directions, will be surprising to any one who has not previously tried it.

Curves in roads are sometimes angular and unpleasing, because laid out merely by guess. By adopting the rule just given, on a more extended scale, a perfect form may be attained, even if the successive stations are merely measured by pacing.

CUMBERLAND CLOD-CRUSHER.

Clod-Crushers are useful only on heavy or clayey soils—and if these are well underdrained, they will not be needed in ordinary seasons. But sometimes heavy rains, and the impossibility of doing all the plowing at the very moment the soil is in right condition, render the surface cloddy, and an instrument like the following, described in the COUNTRY GENTLEMAN by L. Bartlett, will be of much value. Its utility in mixing manure with the soil, by grinding the particles together, is one of its most important uses.

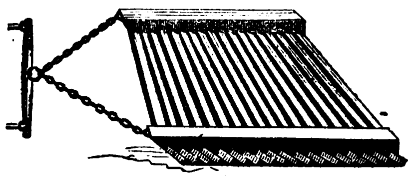


Fig. 1.—*Cumberland Clod-Crusher.*

Another useful and cheap implement I have used, is known in England as the "Cumberland Clod-Crusher." A plate or figure representing it, with a description, &c., I saw in the London Agricultural Gazette, a number of years ago. The writer said, "It is so easily constructed that any carpenter can make one. They cost 30s to 40s, according to their size, and the quality of the wood employed. Perhaps the best size is six feet square. For this size, two, three, or four horses are used, according to the state and character of the soil, and the weight applied." This crusher, it was stated, was more effective in clod crushing than the vastly more expensive Crosskill's crusher.

From the description and plate, I made one of these crushers last year, and find it a very efficient implement, and will attempt to describe it.

I used two inch, seasoned, second growth red oak plank, eight inches wide. I took for the sides two pieces of the plank about five feet long each, on one edge of which, every seven inches, I sawed down two inches, scarped from the saw-cut back seven inches, so that the edge of the plank presented an appearance similar to the teeth of a saw-mill saw. The bottom of the drag was made of plank, eight inches wide, and four and a half feet long, spiked on to the side pieces, so that when completed the bottom part resembled clapboarding. The forward plank slopes high up to the top of the sides to prevent the soil from dragging. The crusher is drawn by a chain made fast to the forward end of the side pieces.

The English statement says it can be made at a cost of 30s to 40s—that is from $7.50 to $10. The plank for mine cost 50 cents, and I made it in less than half a day. If I had taken it a mile to a shop where there are circular saws, I could have made it in two hours. Beside the plank, I used 28 five inch spikes. However, the English crusher has strips of hoop iron nailed upon the wearing edges of the plank, so as to prevent chafing, which pro-

bably is a good plan. The weight of mine, when completed, was 220 lbs., and a pretty good load for one yoke of oxen to draw over the newly turned furrows.

The last of August, I turned over a field of timothy sod land. In consequence of the severe drouth we had, the land did not plow so well as if it had been moister. I put on the crusher and after going over the ground, it looked almost as smooth as a new sown onion bed. The manure was carted on and spread, and the crusher again passed over, which ground the manure very fine and even. The land was then well worked with a heavy cultivator, wheat sown and then harrowed. On a portion of the field I again used the crusher, and on the other a roller. The wheat came up and grew finely, and when the snow came it was altogether the best looking and evenest piece of winter wheat I have ever seen. I also find it a capital thing to press down the snow about my buildings, and breaking out roads, &c.

It is my impression, that this crusher is a much more efficient pulverizer of a hard lumpy soil than a common roller. In the COUNTRY GENTLEMAN of April 21, 1864, Old Hurricane gives us his experience in preparing his land for a root crop. The land was plowed in the fall, and twice in the spring, and four times harrowed to fit it for turnips—"then drills opened and heavily manured in drills, and after the seed was sowed, will you believe, it took two men nearly two weeks with mallets, to break up the lumps, and the lumps were so hard, that it took four to five hard blows to break them," and the crop proved a failure. Now I think if O. H. could have gone over his lumpy soil two or three times with this Cumberland crusher, his lumpy land would have been reduced to a fine tilth with less than one quarter of the labor he expended, and that he might have grown a fair crop of turnips.

As there is no patent right about this crusher, each and every farmer that wishes, can make and use it, without 'let or hindrance.'

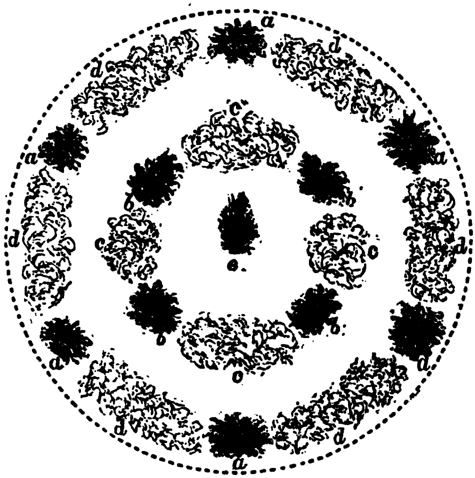
CIRCULAR FLOWER BED.

A correspondent of the COUNTRY GENTLEMAN furnishes the annexed plan of a circular flower garden, and gives the following description of the plants to be employed in filling it, and the mode of arrangement—his object being to dispose of the plants so as to produce the fine effect of massing together, instead of the promiscuous confusion so often prevalent:—"We shall suppose a circular bed with sufficient space for two distinct lines of plants and one central prominent object, in this case a golden arbor vitæ. The first, or outside row, must be dwarf. At regular intervals six nice plants of daphne cneorum would be set out, either in the fall or spring, eighteen inches from the edge. This charming evergreen requires to be pegged down twice a

EXPLANATION.

a. Daphne Cneorum.
b. Salvia patens.
c. Geraniums and Gladiolus.
d. Lobelia speciosa Paxtonii.
e. Golden Arbor-vitæ.

Two bulbs of Lillium lancifolum album, behind the center of the Lobelia, fronting the Salvia, has a fine effect. If exposed to the sun, with no shade whatever, the Lobelia will require to be watered (not superficially,) twice a week in parching weather.



year, when, instead of an unsightly straggling usurper of space, it becomes a dense mass of refreshing green, in May covered with deliciously scented pink blossoms, which are sparingly renewed in the fall. Between each plant of daphne, young plants of lobelia speciosa paxtonii are to be set out in May, covering the whole blank space—say about one root to every five inches. Presently these will close up, and flower throughout the season—color, vivid blue and white. (The lobelia is easily raised by sowing the seed in pots, end of March—placing a square of glass above the soil to retain humidity, and administering water in very minute doses. When the seed leaves appear, remove the glass.) If it is desired, a different plant may be used between each of the daphnes, and so have a variety of colour. But these must all be of the same height. For instance, lobelia; verbena, purple; variegated balm; verbena, white; Phlox Drummondii, (annual); verbena, crimson; or each of the six spaces may be occupied by the best of all annuals, Phlox Drummondii—a separate color in each.

The second, or inner line, is to be struck half way between the first line of plants and the centre specimen—in this instance a golden arbor vitæ of some size, or a well shaped tree box. On this line are to be set out four plants of salvia patens, (the most beautiful blue and prolific bloomer we have during the fall months.) The first of these being planted half way between two of the daphnes, and the other three at equal distances. If properly set out, these salvias will stand as the corners of a square with four blank spaces between—each of these spaces to be occupied by bedding geraniums. These

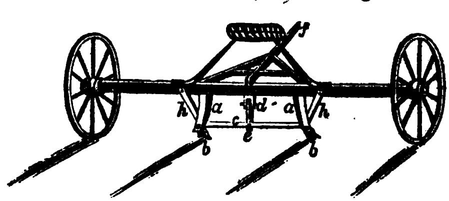
may be all of the same, or each different. The best effect is to be had from a variety, viz: Paul l'Abbey, the very finest cerise red; Christine, by far the best pink, ever blooming; Kingsbury Pet, the best salmon; Princess Alice, or Gen. Pelessier, bright scarlet. The salvias must be carefully trained, and tied to thin but reliable sticks, as their habit of growth is erratic. It is a good spot on which to locate one dozen of gladiolus—three bulbs, half way between each salvia, that is to say, in rear of the geraniums. The long bare stems of the gladiolus penetrate through and above the geraniums, the foliage of which supplies what is lacking on that gorgeous Cape bulb.

Extend the capacity of the bed, and we have then space for an intermediate circle, arranged on the same principle as the others, or better still, alternates, say double white feverfew and antirrhinums, both of which bloom freely all the season, with judicious cutting back as the earlier blooms pass off.

The above is one of the many outlines for the effective planting of beds on a lawn. The same principle is applicable to borders, with a backing of evergreen and deciduous shrubs. It must be borne in mind that a large number of herbaceous plants can be appropriately used to produce bedding effects, and these, instead of being killed by the first frost, are perennial, increasing the stock every season. There is no necessity, therefore, to lay in fresh supplies of bedding stock every spring.

CORN-MARKER.

This corn-marker is attached to Alzerin Brown's Wheeled Horse-Rake. The rake-head and levers are easily detached, the marker attached, and vice versa. The wheels of this rake stand apart 8 feet 3 inches, which, divided by 3, gives 2 feet 9 inches as distance between rows, which is right for us. The scantling *a*, *a*, are 3 by 3 inches, with a mortice in one end for an old cultivator tooth, *b*, *b*—a sny-bill at the other, to attach it to the under side of front cross-bar on the thills—*c* has



a mortice, *e*, in middle for insertion of link *d*—*c* has also two long gudgeons inserted in large staples in sticks *a*, to give independent motion up or down. Link *d* is also attached to lever *f*, on cross bar *g*. By putting the foot on lever *f*, the teeth are raised clear of obstructions, and for turning at the ends of rows; the boards *h* are screwed outside the lags to hold them longitudinally. By tracing one mark with each alternate wheel, the machine

marks three rows at once on the roughest of ground. It has the advantage of a seat for the driver, (not shown,) marking three rows at once, or four if you fasten a long pole just forward of the wheels, with a light chain at each end to trail in the last mark. The wheels make a very distinguishable mark, and last, but not least, you come very near having two handy tools in one.

DAIRY MANAGEMENT.

RULES FOR WINTER FEEDING COWS.

1. Provide comfortable shelter from winds, or stables.
2. Avoid all currents of air through cracks or openings.
3. Attend to ventilation and remove all foul or steamy air.
4. Provide sufficient litter and attend to perfect cleanliness.
5. Feed regularly, or by the watch, as the animals will fret away flesh if the time is delayed.
6. Never give more than the animal will eat,—small quantities, regularly and frequently given, are better than large doses.
7. Never change food suddenly, as from hay to grain or roots, but begin in small quantities and increase gradually.
8. Never feed heavily with grain or meal—animals will thrive better with two quarts at a feeding than with six.
9. A portion of some kinds of roots, as carrots, beets or turnips, contributes to the health and thrift of the animal—a mixture of dry fodder, meal and roots is better than either alone.
10. Clover hay well dried without wetting, is the best fodder—and cornstalks, dried without becoming mouldy and cut finely, the next.
11. Corn meal fed in small quantities is good, but in larger quantity, although increasing milk at first, subsequently augments fat at the expense of milk. Valuable cows have been seriously injured by too large doses of Indian meal.
12. Carrots are the best winter food for milch cows, where the production of good rich butter, like that from grass, is a main object; while field beets will yield more milk in quantity.
13. Provide a frequent and constant supply of good pure water.

Product of Dairy Cows.—At the discussions on the evenings of the State Fair at Rochester, Geo. A. Moore of Buffalo, said that a cow that will not yield 400 lbs. of cheese a year is not worth keeping, yet that in Erie county, 300 lbs. might be considered as the average. A cheese maker at Rome, said that he had a cow that would make 700 lbs. of cheese in a year. Loomis of Herkimer, stated that some of his neighbors regarded it as a

failure if they did not average 600 lbs. of cheese to a cow, in a dairy of 100 cows. In small dairies 825 lbs. on an average had been reached.

OBTAINING THE BEST COWS.—At the same meeting it appeared to be the unanimous opinion, that the best dairy cows could be obtained only by raising them. The cost of raising was estimated at from $30 to $35 each; while their real value, at present prices, would nearly double this amount. As the most productive cow costs no more to keep than an unproductive one, and yields several times the amount of clear profit, it becomes very important to select calves from the best milkers only, and not purchase indiscriminately in market.

GOOD FEEDING.—The productiveness of cows depends greatly on the food they receive. The large products from the Herkimer dairies are obtained by giving the best feed the year round. As soon as autumn feed begins to fail, shorts, ground oats, &c., are regularly given. A small and regular supply of roots would be valuable. They are sheltered from the cold or stabled, and strict cleanliness and pure air attended to.

HOME-RAISED COWS.—It has been stated as an additional advantage in raising cows at home, that the attachment to their native spot is so strong that the milk is often much diminished when removed from it. G. A. Moore of Buffalo, remarked that a cow brought from his farm-house to his home in Buffalo, although attended to in the best manner, diminished one-half in her milk. This is the reason that purchasers are often disappointed in the cows they obtain, and charge false statements on former owners.

FOOD FOR MILCH COWS.—Cornstalks sown thickly for fodder, harvested, well-cured, and kept from fermenting, are probably the cheapest kind of fodder that can be raised for cattle—unless sorghum raised for this purpose should prove by experience to be better. In addition to this, give each animal daily, a peck to a half bushel of carrots, or an equal amount of sugar beets, the winter through. It does not pay to cook them. A small quantity of corn or bean meal, or both, in addition to this, will have a good effect, but not more than two quarts should be given daily, at the utmost.

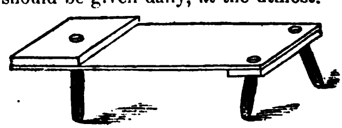


Fig. 1.—*Milking Stool.*

MILKING STOOL.—The stool represented in the annexed figure is described at length by a correspondent of the COUNTRY GENTLEMAN, which he says has given decided satisfaction to all concerned, viz: the milker, cow, milk, stool, clothing or pants' legs, manure, milk-maid, butter-maker, &c. It is made of a half inch board two feet and a half long, and ten inches wide. An inch board four inches wide is nailed or screwed across one end on the lower side, and another across the other end on the upper side. These cross pieces serve to stiffen the stool, and brace the legs. The milker when using it, sits over the single leg with his face towards the other end and his feet on each side of it. The milking pail is placed on this other

end, and is thus kept entirely out of the dirt, beyond the danger of being stepped into by the cow. This stool may be easily turned aside without the milker rising, by his throwing the weight entirely on the single leg. The writer says that the pail being so near the cow, the milk never spatters on his clothes, and he can do his work with his "meetin pants" on without injury. He adds that he has in consequence "saved considerable milk, and had it *clean,* saved scolding, brooming, grumbling, clothing, cramp in his legs, and for aught he knows, a *divorce*, he and his wife still living together."

SUBSTITUTE FOR MILK IN REARING CALVES.—The Irish Farmers' Gazette gives the following:—The best substitute for milk for such a purpose is a compound of 3 quarts of linseed meal, and 4 quarts of bean meal, mixed with 30 quarts of boiling water, and left to digest for 24 hours, when it is poured into a boiler on the fire having 31 quarts of boiling water. Let it boil for half an hour, keeping it constantly stirred with a perforated paddle to prevent lumps and to produce perfect incorporation. It is then put to cool for use, and given blood warm. When first used it must be given mixed with the milk in small quantity, and increased gradually; decreasing the milk in the same proportion till they get the above mucilage only. Indian meal feeds calves admirably, used in the same way; and from some experiments we have made, we think that a mixture of linseed meal, and bean meal, in the same proportions, with a quantity of Indian meal equal to both—that is, 3 quarts linseed, 4 quarts bean, and 7 quarts Indian—equal to any thing we have tried.

FIELD CULTURE OF THE ONION.

The following practical directions are given by Henry Pearcy:

The kind of Soil.—The soil I prefer is a good sandy loam.

Preparation.—If you have some very rotten manure free from weed seed, apply forty or fifty two-horse wagon loads to the acre. If you are not sure your manure is free, or nearly free from weed seeds, you had better not apply it, for there will always be an abundance of weeds at best. In place of manure use two hundred bushels of leached ashes to the acre, and plow six inches deep, and then drag and pulverize the ground well; then roll with a light roller to mash lumps, and drag again or rake to make light and fine on the surface. The past year I used a fine-toothed drag, that cut once in two and a half inches, behind the roller, so the ground was finished at one operation.

The Kind of Seed and Quantity.—The kinds that I have raised most are the Yellow Danvers and Large Red, principally the latter. The amount of seed per acre will depend on the knowledge one has of its age. I prefer to sow as near three lbs. to the acre as possible, if I know the seed was

raised the year previous; if not sure apply more. Last year the writer saw an acre of onions on which there was only three-fourths of a pound of seed put, but the onions were not a third as thick as I generally leave them.

Sowing.—The time I recommend sowing onion seed is just as early as the ground can be properly fitted in the spring. In sowing it is best to drop a seed as often as one an inch, so as to have plenty come up. If the seed are sown by hand, they had better be mixed with sand or plaster, so that they can be sown without danger of getting too thick. I prefer a drill to sow with, because it sows evener than any person can possibly by hand. In regulating a drill to sow, it is best to try it on a floor, with a slide in the drill that you think about right; if it sows too thick—which you can readily see by counting the seed dropped—substitute the slide in the drill by placing one with a smaller hole, and so experiment till the right quantity is dropped. Cover the seed one-half inch in heavy loam soil, and three-fourths an inch or more in light soil, and roll it smooth. Sow the rows sixteen to eighteen inches apart, as that is near enough if they grow rank, and it is handier to weed when that distance, after the onions get large.

After Culture.—By all means start a hoe or some weed-cutter as soon as the onions are large enough to see the rows. Some recommend sowing radishes with the onions so to follow the rows more readily.

When the onions are up to four or six inches, thin to one inch if the ground is *very rich;* if medium, to two inches; if poor, to three or four inches. One inch may seem to make near neighbors, but the writer has practiced that plan on first-class soil, and found the onions to get plenty large enough. I have had them yield five bushels to the rod, for a number of rods in succession, but from two to three bushels is a good average. Any time after sowing seed, give as a top dressing (before a rain if possible,) equal parts of plaster and hen manure, at the rate of four quarts to the square rod; and through the season another dressing, the same, or unleached ashes, at the rate of a peck to the square rod.

Charcoal is also an excellent dressing for onions, or if a person has plenty, it would be a good plan to powder it as fine as possible, and apply before plowing. Ever bear in mind to keep the weeds down.

I am aware that some onion-raisers recommend breaking down the tops when the bulb is nearly grown, thinking that it will bottom better. I have always considered that a "granny" notion, and let the tops fall naturally.

Harvesting.—When a majority of the tops are withered down, I take a potatoe hook and carefully pull the onions, let them lay on the ground till cured, then cut the tops off and market, if the market suits; if not, it is better to place them on a barn floor or some dry place.

Raising Seed.—In raising seed always pick out the largest or medium sized onions, as near the same shape as possible. When the time arrives for setting out, mark rows as wide as for corn, take a hoe and dig a trench three inches deep, and place the onions eight inches or more apart, and

cover and press the ground well. A row of seed can be sown well enough between these wide rows, and will yield well. The object in placing the onions for seed so far apart, is that there may be plenty of room to keep out the weeds. I once planted some onions for seed with the rows not more than sixteen inches apart: the consequence was I could not get among them to weed: when large, up came the weeds and blasted the onion seed. When the seeds are black and begin to get hard, cut off the stalk six inches below the heads, and spread where they can dry; thresh out the seed, and clean as clean as possible with a fanning-mill; then place the seed in a pail of water and stir: the poor seed will arise, which skim off; then spread the seed that settled, in the sun or near a stove to dry, and I will warrant that you will have better seed than can be bought of nine out of every ten seedsmen.

RAISING VEGETABLE SEEDS.

The following excellent remarks from J. S. Ives, Salem, Mass., a writer of experience, are copied from the COUNTRY GENTLEMAN, and furnish information in relation to which there has been much inquiry.

Having for the past few years devoted much time and attention to the careful raising of the most prominent and important varieties of vegetable seeds, and finding no work or newspaper article treating upon this important subject of farming, a few hints may not go amiss through the minds of your interested readers.

In the first place I have always been careful to grow but one variety of a certain species, that is, one variety of cabbage, one of onions, &c., unless grown on separate farms, or so far from each other as to render it impossible for them to hybridize or mix.

It is an apparent mistake that vegetables set for seed need but little manure; they should be well manured with old decomposed compost, with particular care that the manure is kept from immediate contact with the roots or small fibres of the vegetables. I prefer broadcast manuring, spread and plowed in in the fall. Seeds grown on rich soil will be large, well matured, and ripen earlier than when raised upon poor starved lands. In selecting vegetables intended for seed, as much care should be taken as in the selection of stock animals for breeding purposes. I have known many farmers to dispose of their best vegetables, reserving for seed those of inferior quality, unfit for the market, the result of which would be inferior seeds, producing inferior vegetables the following season, and eventually degeneration, or, as the farmers term it, running *out*, to a worthless, unpalatable article. The vegetable should be sound, and in a healthy condition when set out in the spring.

I will give briefly my mode of raising a few varieties of the most important vegetable seeds. My cabbages, "the Mason or Marblehead variety, which originated from seeds imported by us," are selected with great care; those only that are solid and well proportioned, are chosen in the fall; they are set out in drills, and late in the fall covered four inches deep with soil, and afterwards one foot of litter is placed upon them. In the spring they are removed and set out in drills four feet apart each way, and the top of the cabbages are cut crosswise about two inches deep, to enable the centre shoot to break through. When the stock is about one foot high, the side lateral, or any that may not sprout from the immediate centre of the cabbage, is removed, and nothing left but the main or centre branch. Seeds grown in this manner will be sure to produce heading cabbages the following season. Beets, carrots, parsnips, and other vegetables are served in the same way, with the exception of cutting, which is unnecessary, and often dangerous with most vegetables. To ensure large and well developed carrot and beet seeds, it is very important that the scissors be freely used, removing the side or imperfect laterals two or three times during the season. Turnip seed is easily raised in time to sow the same season. The Purple Top Strap-leafed variety is preferred in our vicinity; the White Strap-leaf is also much esteemed as a table variety.

The responsibility of the seed grower is very great, and therefore seed grown properly should command much higher prices than worthless seeds often sold to the innocent purchaser, to the great injury, and perhaps entire loss of his year's work. Never plant varieties of the same species near each other. But different species will not hybridize, that is, the Crookneck squash and the *so-called* Marrow or Hubbard squash can be planted together without fear of mixture, one being of the type of squash, the other of the pumpkin; the same with cucumbers, melons, &c.

As much of the farmer's success depends upon the seed he sows, the greatest care should be taken to procure responsible and well grown varieties; but this is not all that is necessary to ensure good crops. See that the proper manure is used, and plenty of it; that the soil and situation is suited for the variety chosen for it, and also attend to the proper cultivation throughout the season, for the neglect of any one of these precautions often produces a ruined or worthless crop.

RABBITS GNAWING TREES.—Let me repeat it, for my neighbor says several of his fine young apple trees have been ruined lately by the rabbits gnawing them:—Take thick *lime whitewash* and thin it with strong *tobacco juice*. A bucket full will serve 200 trees, and a man can make it and put it on in half a day. It is effectual, for I have tried it. SUEL FOSTER. *Muscatine, Iowa.*

A FEW OF THE NEWER PEARS.

Some of the newer pears which have now been tested with many years trial, and proved valuable, are worthy of particular notice in the REGISTER. Among some of the best are the following:

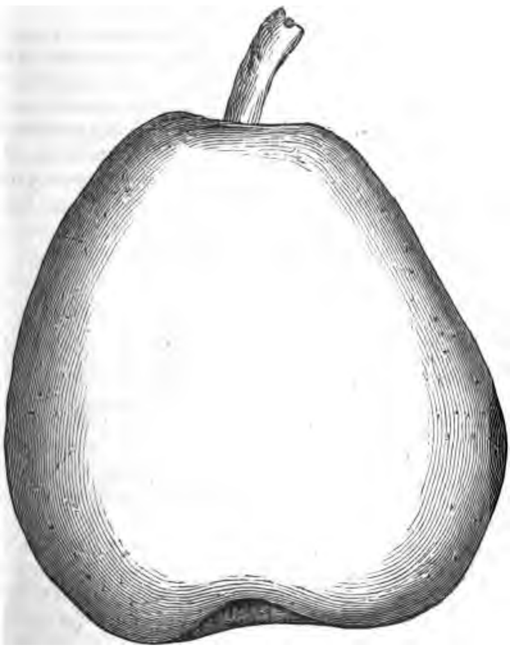


Fig. 1.—*Beurre d'Anjou.*

BEURRE D'ANJOU, (fig. 1.)—This variety, although not very showy nor very productive, is one of the most faultless of all the newer sorts. It grows well, both as a standard and dwarf, bears moderately and evenly without being overloaded, and the fruit is of uniformly fine quality.—The fruit is rather large, distinctly obovate, well-rounded; stem short and thick, inserted in a slight, russeted cavity; calyx small, in a quite small russeted basin; skin greenish, often slightly russeted, sometimes with a reddish brown shade to the sun; flesh slightly granular, buttery and melting, with an excellent flavor. It ripens about the middle of autumn, and will keep for some time. This variety is of French origin, and is one of the several foreigners, such as the Bartlett, Urbaniste, Flemish Beauty, Belle Lucrative, Rostiezer, Giffard, Louise Bonne of Jersey, &c., which appear well adapted to the climate and soil of this country.

BUFFUM, (fig. 2.)—This is another sort which succeeds well both on the pear and quince. It is a very strong, handsome, upright grower, with rich, brownish shoots, and is a prodigious bearer. The tree is very hardy, and endures the severe winters of the west. It is, on the whole, one of the

best pears for orchard planting; and when the fruit is gathered a week or two before maturity, it ripens well in the house and assumes a fine flavor; if left on the tree till ripe it is often poor in quality. When the tree attains size it assumes a handsome, symmetrical form, and when loaded with fruit is an ornamental object of no ordinary character. A few years since the writer saw a tree on the

Fig. 2.—*Buffum.*

grounds of Edward Earle, Worcester, Mass., twenty-three years after grafting, which was bearing 27 bushels of fruit—two years previously it bore twenty-five bushels. The Buffum pear is of nearly or about medium size, regular obovate; skin brownish-green, becoming deep yellow, sometimes slightly russeted, with a large, rich red cheek; stalk an inch long, slightly sunk; basin small; flesh white, buttery, not melting, of a very sweet and fine flavor.—At the meeting of the American Pomological Society in 1849, the Buffum was strongly denounced by several members for its alleged deficient flavor,

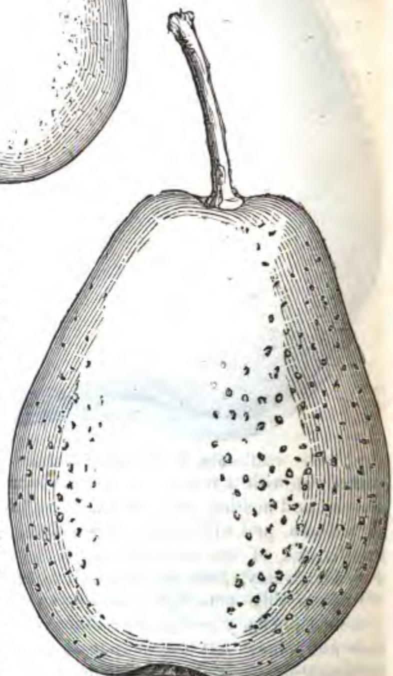


Fig. 3.—*Washington.*

but this opinion no doubt arose from the practice of leaving the fruit too long on the tree. It has since been widely cultivated and generally approved and adopted. It is a native of Rhode Island. It ripens during the early part of autumn.

WASHINGTON, (fig. 3.)—This excellent and valuable variety, although known for many years, has not been so widely known and disseminated as its merits deserve. It is a native of Delaware, and succeeds well everywhere except in the extreme North. The tree is hardy and grows on light or gravelly as well as on heavy soil. It is a good and uniform bearer. The fruit is medium in size, oblong-pyriform, obtuse or flattened at each end; skin smooth, clear, light yellow, with many large crimson dots on the sunny side; stalk an inch or more long, slightly sunk at insertion; calyx in a shallow basin; flesh white, juicy, and slightly breaking in texture, very sweet and excellent in flavor. Ripens early in autumn. It does not succeed when worked on the quince.

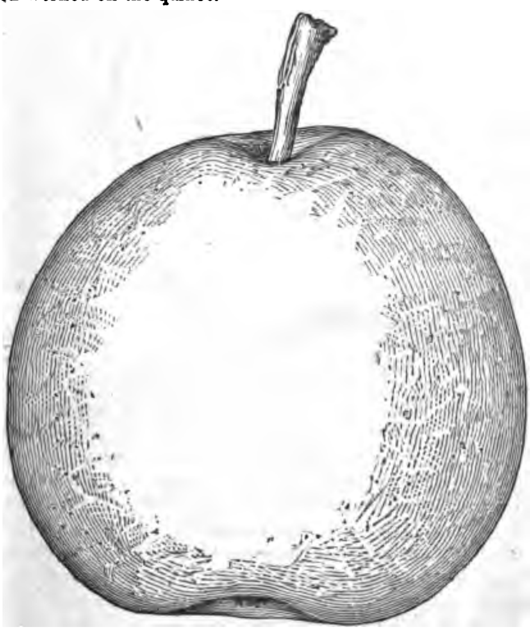


Fig. 4.—*Sheldon.*

SHELDON, (fig. 4.)—No American variety has exceeded this pear in the high character it has attained during the few years of its genersl cultivation.

At the meeting of the American Pomological Society in 1856, C. M. Hovey of Boston, said that he considered it the best pear in America, and that no foreign pear was superior to it; and at the meeting, six years afterwards, P. Barry remarked that he regarded it as one of the finest of all our pears. It originated in Western New York. It is a strong and vigorous grower, (the shoots being yellowish brown in color,) and forms a handsome tree. It bears well, although not usually so young as some other sorts. It grows on the quince only when double-worked, and then probably only for a limited number of years. Fruit rather above medium, sometimes quite large, roundish, somewhat flattened and occasionally approaching obovate. Whole surface covered more or less with a greenish russet, becoming cinnamon brown. Stalk short, in a narrow cavity; basin rather large. Flesh slightly granular, very juicy and melting, with a high, rich, brown Beurre flavor. Ripens middle and latter part of autumn.

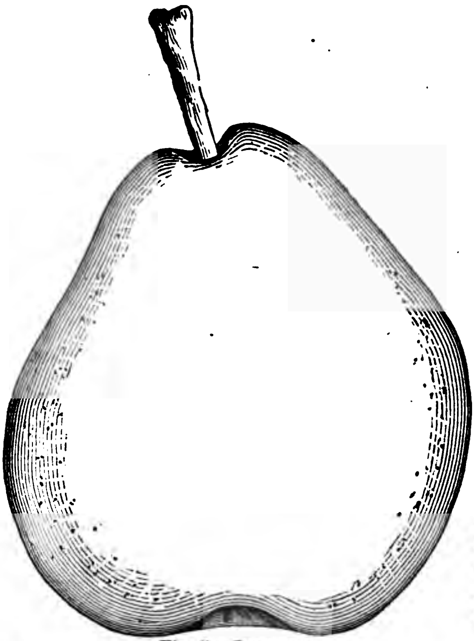


Fig. 5.—*Lawrence.*

Lawrence, (fig. 5.)—No early winter sort is at present more highly valued than the Lawrence. It originated at Flushing, L. I., and has now been generally introduced throughout the East and West. The tree is a moderate but stout and healthly grower, and is remarkable for retaining its leaves late in autumn. In most places it has proved a good bearer. The fruit is medium in size, obovate-pyriform; color clear yellow with numerous fine dots; stalk an inch or more long, set somewhat obliquely in a small cavity; calyx partly closed, set with fleshy wrinkles; flesh buttery, with a very sweet and excellent flavor. This pear keeps and ripens easily and is of uniform excellence. Its time of ripening varies somewhat with the warmth of the season—from late autumn to early winter.

JONES' SEEDLING, (fig. 6.)—A new variety which originated near Philadelphia. Although not extensively tested, it promises to be a valuable, fine and agreeable early winter pear. It is rather below medium in size, obovate-turbinate, being broad at the blossom-end, and taper-

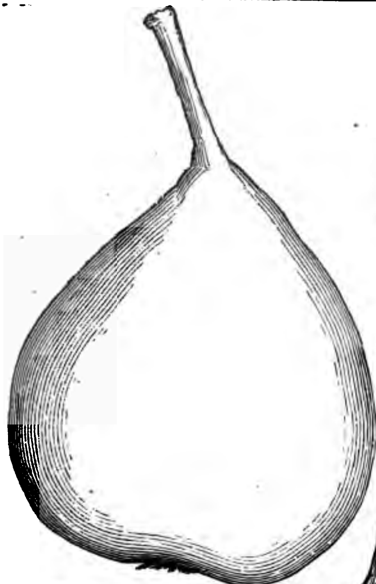


Fig. 6.—*Jones' Seedling.*

ing to the stalk; often a slight suture from stem to crown; color yellow; whole surface suffused with thin russet; stalk rather small, an inch long; calyx wide in a very shallow basin; flesh very juicy, melting, buttery, with a

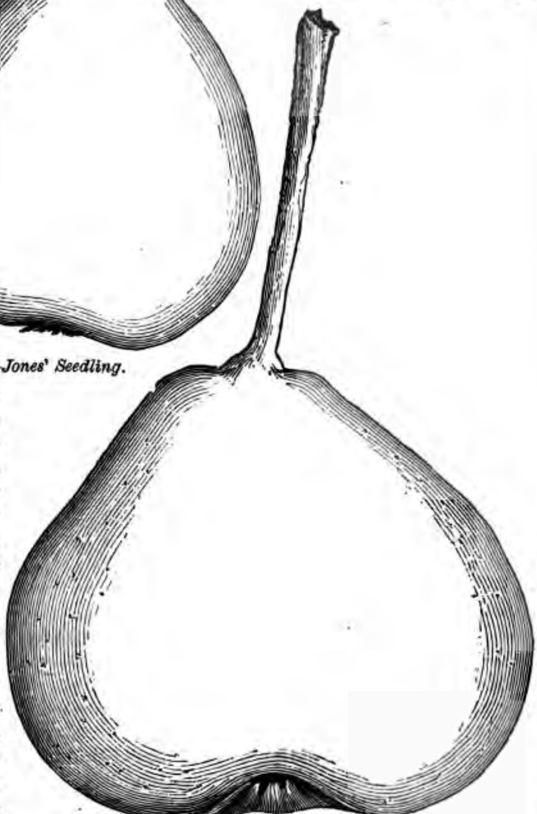


Fig. 7.—*Josephine de Malines.*

pleasant, sprightly, nearly sweet flavor. It is a great and early bearer, and the fruit is a remarkably easy keeper.

JOSEPHINE DE MALINES, (fig. 7.)—This is a foreign variety, and is one of the best early winter pears. The tree is a good grower and forms a handsome pyramid on the quince. The fruit is medium in size, roundish, broad and flattened; skin yellowish with small dots; stalk very long in a slight cavity; basin large; flesh a light salmon color towards the centre, buttery, of a sweet and peculiar flavor.

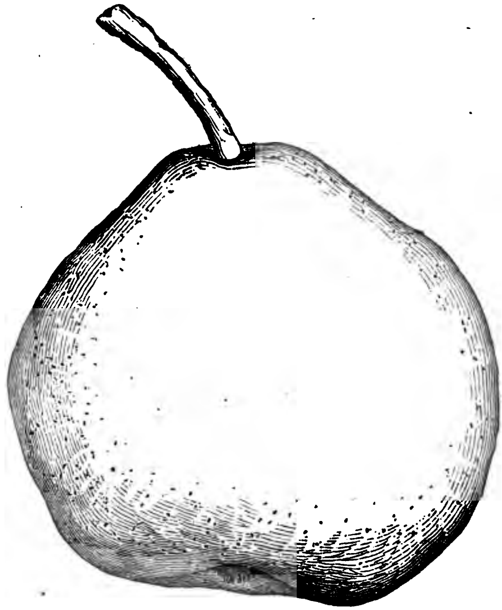


Fig. 8.—*Church.*

CHURCH, (fig. 8.)—This pear was brought to notice by S. P. Carpenter of New Rochelle—a large tree growing in that vicinity, two feet in diameter, and bearing fifteen or twenty bushels annually. It is vigorous and spreading in growth, uniformly productive, and the fruit unvarying in its good quality. A dwarf tree, eight years of age, on the grounds of the writer, is thrifty and bears well.

The fruit on old trees is rather below medium, on young trees usually large; roundish, inclining to oblate, and tapering slightly towards the stem —often slightly ribbed at the crown; color, light yellow, with many small and inconspicuous dots; stalk an inch or more long, set in a slight cavity;

calyx closed, in a slightly furrowed basin; flesh fine, very buttery, melting, with a very sweet, rich and "very good" flavor. It ripens through September.

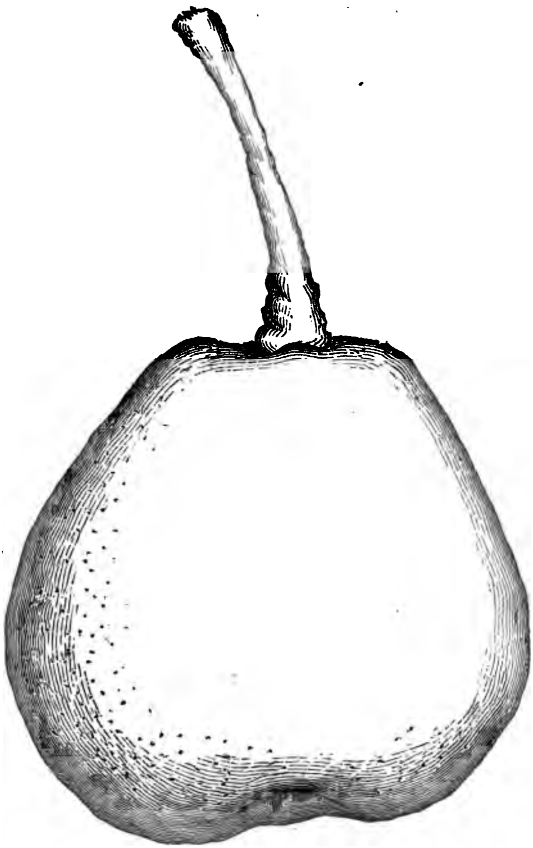


Fig. 9.—*Edmonds.*

Edmonds, (fig. 9.)—This new variety recently introduced by Ellwanger & Barry, of Rochester, promises to stand among the highest for quality, although the fruit is not so handsome as many others. The tree is productive and a good grower. It ripens in September.

In size it varies from medium to large; form obovate, surface somewhat

wavy or irregular, stem long, stout and fleshy towards the base, set in a moderate, knobby cavity; basin ribbed or uneven; flesh yellowish-white, very fine-grained, melting, with a sweet, peculiar, delicious and excellent flavor—standing as "best" in the pomological scale, and being fully equal to the best Belle Lucratives, and possessing all the peculiar delicacy of the best grown specimens of the Des Nonnes.

The original is an old tree, and the pears being allowed to ripen and fall to the ground, their excellence was never developed nor discovered until submitted to house-ripening—another proof of the importance of rejecting no sort until this mode of ripening has been adopted.

NEW AND DESIRABLE FLOWERS.

Every season we have announced in the seedsmen's catalogues a list of new flowers, under the heading of novelties. These are principally sent out by the seedsmen of Europe. Some of them are improved varieties of well known species, perhaps accidental seedlings of the garden, though often the results of careful and somewhat systematic hybridization. Others are the discoveries of explorers among the wild flowers of Japan, China, and other countries, whose flora is comparatively unknown to the botanists and florists of the more civilized portions of the globe. To this collection we look mainly for evidences of progress in the floral art. Sometimes we are sadly disappointed, as the strangers introduced with such favorable recommendations to raise our expectations to the highest point, do not always bear acquaintance well. Some do not prove better than old friends of the same family, while others are not superior to old acquaintances whose company we have long ago discarded on account of their bad habits. Occasionally

Fig. 1.—*Tagetes Signata Pumila.*

we meet with an old and valued friend, a native of our own country, introduced as a stranger—an aristocratic count, or something of the kind, from a foreign land. Others prove most desirable acquisitions, and I will briefly describe a few of them, introduced during the past six or eight years.

TAGETES SIGNATA PUMILA, (fig. 1,) introduced by Vilmorin, of Paris, is a charming plant, from twelve to eighteen inches in height, forming a globular dense mass. The leaves are finely cut, flowers single bright yellow, marked with orange. A most profuse bloomer.

Fig. 2.—*Double Zinnia.*

THE DOUBLE ZINNIA, (fig. 2,) was first shown in the London Horticultural Society's exhibition in 1860. It was grown in this country in 1861, and no flower has gained such popularity in so short a time. It is admirably adapted to our climate, bears transplanting well, and is in all respects valuable. Every season has witnessed a great improvement in the form and color of the flowers. They are now of every shade of red, scarlet, orange yellow, and we are now looking for a good white.

THE DOUBLE PORTULACCA, (fig. 3,) is a most beautiful flower, as double as the rose, and but for the difficulty in obtaining good seed cheap the single varieties would soon be discarded. The *double* flowers produce no seeds,

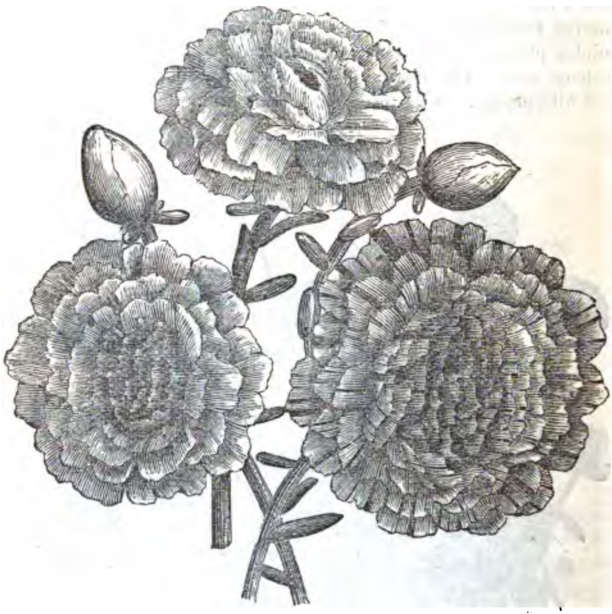


Fig. 3.—*Double Portulacca.*

and all our attempts at hybridization have failed. The best imported usually produce 75 per cent of double flowers, but occasionally there is a failure even in the best foreign seed. The engraving shows three flowers of the natural size, with buds, as grown by me the last season.

DIANTHUS HEDDEWIGII, from Japan. A decided improvement on the Dianthus Sinensis. Single, very large, and of the most brilliant colors. This was followed by double varieties, very large and showy, though less brilliant in color than the single. Dianthus Lasciniatus, both double and single, has deeply cut edges. The double flower is three or four inches in diameter.

RODANTHE ATROSANGUINEA AND R. MACULATA ALBA will please all who cultivate the everlasting flowers. The first is of a reddish purple color, and the latter pure white.

AGROSTEMMA CEOLIA ROSEA FRINGED DWARF, is a great improvement on

Ceolia Rosea, of dwarf compact habit, flowers delicate rose, whitish center, toothed and fringed very prettily. Flowered here the present season for the first time.

Fig. 4.—*Helipterum Sanfordii.*

Helipterum Sanfordii, (fig. 4,) is one of the very best everlasting flowers, of dwarf tufted habit, with large globular clusters of bright golden yellow flowers. The engraving shows a branch of about the natural size and a plant reduced in size which exhibits the habit of the plant. Introduced to this country in 1864.

TROPEOLUM KING OF TOM THUMBS, the best dwarf Tropeolum we have ever grown, bluish green foliage, plant of dwarf globular habit, flowers of the most intense scarlet.

WAITZIA CORYMBOSA, a very pretty everlasting, of compact growth, branching, flowers double, rosy white, yellow disk. Blooms freely in August and September.

Other novelties of this season's importations are promising, but I cannot speak decidedly in favor of those I have not named, except perhaps Antirrhinum Tom Thumb. This is decidedly pretty, not more than six inches in height. J. V.

TRAINING GRAPES AS PYRAMIDS.

This mode of training, if skilfully and neatly performed, presents a fine ornamental appearance, and is well adapted to such gardens as a formal trellis might injure in beauty. It is also an easy and convenient mode for keeping new kinds in shape, until they are sufficiently tested, as a small tree trimmed bare, except a few of its limbs, furnishes a ready support. A larger tree, thus prepared, will answer for grapevines, intended to bear permanently. In this case, the most durable wood should be selected, such for example, as the red cedar. The constant exposure to the dampness and shade of the vine, tends to induce decay. This support is easily set in the ground by driving the sharpened end into a crow-bar hole. The vine may be allowed to grow two or three years previously.

Pyramidal Grape.

In training the vine to this support, a process for pruning may be adopted similar to that employed in fan or spur training—the main shoot or shoots passing spirally around the stem, and the spurs, or short canes, extending outwards and being supported by the diverging limbs. The pruning is best performed by allowing two shoots to grow in an upright

and spiral position, and allowing them to increase a foot and a half, or two feet in length, each year, the surplus being cut back.

The size of these supports must vary with their intended purposes and with the character of the variety. If for permanent bearing, or to continue twenty years or more, they should be much larger than for a few years trial. The Delaware and Rebecca do not need support so large as the Isabella and Concord. The latter, to afford ample room, should be twelve feet high or more, and the side limbs should extend about three feet at bottom, and be shorter as they approach the top. If the part which enters the ground is well coated or soaked in gas tar, this part will last as long as desired.

WINTER EVENINGS FOR FARMERS' BOYS.

Every farmer, whether his business be on a limited or an extensive scale, should labor some with his own hands. He should know practically how to perform all the different farm operations with skill, that he may instruct his men and take the lead in cases of emergency. By doing so he will avoid that feeling of dependance and helplessness which will occasionally come over every one who depends entirely on his hired men. If his farm is small, he may, if he chooses, spend most of his time in personal labor; but if it is extensive, his frequent examinations of every part, and proper supervision of its labors, will render much work from his own hands unadvisable and even unprofitable. But our object at present is to speak more particularly of farmers' sons. While they should learn to do all kinds of work, they should not be worn down by it. The development of the mind as well as of the body, is worth far more to them than large and hard-earned estates. They should not, on ordinary occasions, have to labor so severely as to unfit them, during the season of short days, for evening improvement. There is no greater benefit which a parent can confer upon his son, in order to fit him for success in life, than to give him a taste for intellectual cultivation. Every association should therefore be thrown around him, and every attraction offered to induce mental culture and refinement. The farmer, therefore, who cannot afford separate rooms in his dwelling for a parlor to receive company, and a study or library for his sons, should give up the former for the sake of the latter. A good study-room should at least be secured, whatever else may require to be sacrificed; and this should be made attractive in an intellectual, literary and scientific point of view, so far as may be practicable. Young men and boys will then be less disposed to stroll about during the long evenings of winter, or spend their time in idle talk and bar-rooms, stores and other places where the idle and uncultivated assemble, and where they often acquire the first lessons in smoking, drinking and gaming.

Among the various occupations for evenings, may be mentioned the following: Drawing designs of houses, barns and other farm buildings, and

planning their internal arrangement; sketching objects in natural history, writing essays on rural subjects; consulting and comparing the views of authors; and especially important, the practice of keeping a regular register of passing events. This register may be kept in a single blank book, embracing observations on the crops and the result of management, on the weather, including notices of the winds, clouds, storms, meteors, &c., on the appearances of birds, the advance of vegetation, and on various occurrences, either of an immediate personal nature, or from more widely extended observation. It may be deemed best to procure different blank books for different departments, as, for example, one on natural history, another on agriculture, and a third on the occurrences of the day. Parents should encourage their children to keep such records, as the practice not only improves them in writing, thinking, acquiring information and arranging their thoughts, but such records may be referred to in after years, and will be found interesting as well as valuable in many ways. In order to encourage young people in this practice as well as to perform it in a neat and finished manner, handsome and suitable blank-books may be given to them, as appropriate Christmas, New-Years or birth-day presents; or neat writing desks, or portfolios, furnished in the same way.

The many excellent designs which we receive for publication of various rural contrivances and structures, possessing much merit in themselves, but drawn in an imperfect and bungling manner, show the great and prevailing want of instruction in drawing, or encouragement of its successful study. Every facility should, therefore, be afforded for improvement in this art—pencils, and the best instruments for drawing plans and designs should not only be furnished, but the importance of executing the work in the neatest and most accurate manner, shown to the young artist. We once knew a boy who, without any instruction or guide, selected the most finished and finest steel portrait within his reach as a lesson to copy—and determined to execute the work well. He spent nearly an entire week on one eye and the nose, with great success, for the closest scrutiny could scarcely have discovered any inferiority to the original. Although such extreme care may not be advisable in ordinary cases, yet it is incomparably better than the more frequent hasty, careless, inaccurate, distorted and coarse productions so frequently seen.

An interesting winter employment may be afforded to young farmers, by comparing and digesting the many items of interest comprised in a farm diary kept during the preceding season. The results of various practices may be observed and compared, and valuable information thus derived in relation to the most profitable points in management. A memorandum book may be made from these examinations for the labors of every week during the coming year, which may include many suggestions for future observation and experiment. All these will not only enable the young farmer to reach a degree of perfection and profit which those who depend only on their

memory, cannot attain, but the practice will lead to order and system, and prevent the omission of many essential operations in farm management.

There is no class of scientific studies, connected with rural pursuits, more interesting and appropriate than those of the different branches of natural history, such as botany, mineralogy, geology, entomology, &c. The library and reading room, which every farmer who has children should provide for them, will be all the more interesting for the collection of minerals, the specimens of dried plants, or the cases of insects which it may contain. Skillful young men and boys will construct these cases with their own hands. A farmer's son, whose herbarium contained fourteen hundred species of plants, not possessing much pecuniary means, purchased the paper and bound with his own hands the nine neat and thick folio volumes which contain the specimens. This may not be usually necessary, but the more that young people learn to manufacture and help themselves, they will not only become more skillful and less dependent on others, but will acquire an interest which merely purchased objects will not give them.

WHAT SHALL FARMERS DO?

What should be the aim of the farmer in the present extraordinary position of his business? This is a very proper question to ask at the present time, when the labors of the past season have closed, and while some time yet remains, before the opening of another spring, for a thorough consideration of the subject and arrangement of future plans.

The high price of almost every farm product operates as a strong stimulant to every farmer to make the most of his land; but a serious obstacle is met at the very first step by the extreme scarcity and high wages of farm labor. This dilemma is very likely to lead many to the old and unprofitable course of *skim-culture*, unless prevented by proper intelligence on the subject. Farmers will be tempted, in the hope of doing all they can with a small amount of labor, to omit practices essential to high cultivation and success. They will try to plant and sow fifty acres of land with a force scarcely sufficient to go over thirty acres in the best manner. As a consequence, they will plow wider and shallower furrows, and harrow the land hastily, and trust to good luck in giving heavy crops in return. Heaps of manure will either lie unspread, or if actually applied, will receive less harrowing, and be badly intermixed with the soil. Broad corn-fields will be marked with uneven patches, and be encumbered before autumn with a heavy growth of weeds. In other words, they will have selected, by such management, the very worst system, and that the least adapted of all to the present emergency. Skim-culture requires more labor, for what it obtains, than high farming. Every skillful manager knows that it is easier and cheaper to obtain a thousand bushels of corn from fifteen acres than from fifty. It is

not because the successful farmer obtains occasionally a very large crop or a high price that he makes the business permanently profitable, but because he uniformly raises good crops without failure through all the vicissitudes of seasons. This he can only do by keeping his land in the best condition, and giving the best cultivation. The superficial manager sometimes sees an occasional or accidental good crop raised with little care; and he is tempted to try the same mode in other instances, with the hope that each will prove alike lucky, although the failures may be nine cases in ten—in the same way that weak-minded people venture their property in lottery tickets, although they know their chances are very slim for obtaining anything in return.

It should be a prominent aim at the present time to concentrate labor—not to spread it over an extended surface. The former, if well-directed, will be sure to bring certain returns; the latter, very uncertain profits at best, with a strong probability of failure. Cultivators, who uniformly raise good crops, are those who are careful never to waste labor—who do not apply manure to a wet soil where it cannot possibly afford a fair return; who avoid planting so late that a heavy growth is impossible; or who undertake so many operations that they can never properly accomplish any. They take time by the forelock—they refuse to begin any operation that they cannot carry through in the best manner—they keep all their operations in a compact shape—and by good calculation, and well laid plans, every thing is up to time. They thus obtain more from a given amount of labor than can be possibly reached in any other way. This is the very kind of management suited to the present emergency. The farmer who is compelled to pay two dollars a day to laborers, will receive more by such management than by spreading the labor over a broad and profitless territory.

Every one should know, long before spring commences, precisely what he is able to accomplish, and what he is going to do. If contingencies are depending, plans should be well laid for each contingency. Taking the number of days from the opening of spring until planting time, and allowing one-third at least for raining days and accidents, he should know by the amount required for each day's plowing, how he will come out in his undertakings. If he finds he has marked out too much, he ought to reduce at once the proposed extent of his operations. If he does not, he will be sure, in the first place, to do his work in a hurried manner, and secondly to plant too late—the two great leading causes of bad farming. These will be followed by weedy crops, because he will be behind hand all summer; and his labor, for which he pays two dollars a day, will really cost him four or five dollars, because it will be continually applied to a disadvantage,—to the wrong end of the lever. It is more than usually important, therefore, to examine and digest plans thoroughly during the present winter.

In the meantime, everything practicable should be done now that may interfere with the regular order of labor after spring opens. Fences should be repaired in open weather to prevent that worst of all interruptions—in-

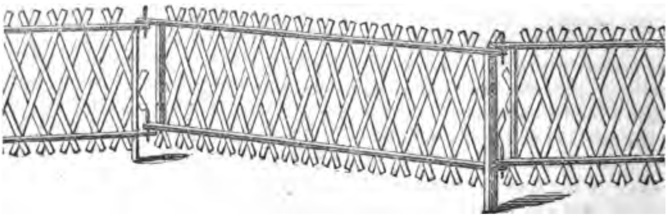
truding animals. A half-year's fuel should be procured and prepared for use. All the manure that is accessible should be drawn out, and spread in the best manner where it is intended to be used—it will be of more value to the coming crop for this early application, and the ground will not be cut up and poached by the horses and wagon wheels used for drawing out the manure on the soft soil of spring; and lastly, and by no means least, procure the very best implements, and have them completely ready when the campaign opens. A hoe that will enable the laborer to accomplish fifty per cent more in work, will not be long in paying for itself at present high wages. The plow that inverts the soil in the best manner, and runs with the least force of draught, will add many dollars' worth of time to the man and team who use it throughout the season.

There is another very essential point to success—and this is that every manager should give close attention to the execution of every part of his plans. An eminent stock-raiser made it a rule to place his hand daily on every one of his animals. If anything went wrong he was sure to detect it immediately. If any improvement was suggested he was able to see it carried out under his own inspection. The extensive farmer will not be able to perform continued labor, for he should witness so far as practicable the operations of every department. And yet if he is a skillful worker, with his own hands he can not only correct many imperfections in the work of his men, but often throw new life into them in cases of emergency. The limited farmer, who has less to oversee, may, to a greater or less degree, occupy himself with regular labor; but still if he is an observant man he will find that it is better to err by too much supervision than by a neglect of many important points involving considerable amounts, for the purpose of accomplishing a single day's work.

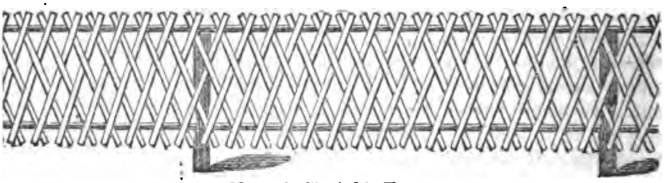
To sum up then—let the order for the coming season be—1st, well-digested plans; 2d, concentrated labor—or everything done in the best manner; 3d, the best tools in readiness; 4th, the performance of everything in winter that may interfere with spring and summer work; 5th, personal supervision of every department.

HAYNES' PORTABLE FENCE.

A few years ago a large number of patents were awarded to zigzag portable fences made of boards. Nearly all these were heavy and cumbersome, and liable to be blown over by winds. Generally they did not answer the purpose. More recently we have met with Haynes' portable fence, which we have found on trial to possess the advantages of cheapness, strength, lightness and neat appearance—at the same time this fence is easily secured against the wind. The accompanying figures represent it as erected according to two different modes. One is the zigzag form, the ends merely resting



Haynes' Worm Fence.



Haynes' Straight Fence.

on the earth or flat stones, and being easily moved from one place to another, as desired. The other is the straight fence, attached to fixed posts. The lengths are so light that 25 or 30 of them can be placed in a two-horse wagon, and two men will easily erect a hundred rods or more in a day. It is easily prevented from blowing over by placing stones in a corner made by thrusting a rod or stick through the fence.

The straight fence possesses the advantage of not requiring faced posts; round or crooked ones may be used by sawing and chipping out a slight notch for the ends to rest on.

A great advantage which this fence possesses is the great strength imparted by interlacing the cross bars, preventing any distortion or sagging. The stuff being sawed of the right size, it is put together with rapidity. The cross bars should be soaked in lime-wash or gas-tar to render them durable.

Where lumber is $2 per 100, the lengths may be made and sold at $1 each at a handsome profit, and at corresponding rates for other prices of lumber.

Single lengths may be used for farm gates, making a neat appearance. They also form excellent sheep and cattle racks, by connecting the ends with short panels made on purpose.

PHILADELPHIA BUTTER.—One reason that we have seen assigned for the acknowledged superiority of Philadelphia butter, is the care farmers in that section take to remove every cow whose cream, partaking of an oily character, does not separate freely from the milk, but is what dairy-women call *ropy*, and will never harden into anything but *oily* butter. The editor of the Rural Advertiser says he once owned one such cow, and her milk spoiled the butter of twenty cows.

FRUITS AND FRUIT CULTURE.

Pears for General Cultivation.—At the last winter meeting of the Fruit Growers' Society of Western New-York, a ballot was taken with the following results:

Summer Sorts.

	Votes.		Votes.
Giffard,	11	Osband's Summer,	8
Tyson,	10	Brandywine and Bloodgood, each	2
Doyenne d'Ete and Rostiezer, each	9	Dearborn's Seedling,	1

Autumn Sorts.

	Votes.		Votes.
Bartlett and Sheldon, each,	16	Beurre Bosc,	4
Angouleme,	14	Howell,	3
Louise Bonne de Jersey,	13	Washington, Buffum, Des Nonnes, Onondaga Kingsessing, each	2
Anjou,	9	Clairgeau, Church, Superfin, Dix, each	1
Flemish Beauty, Diel, and Belle Lucrative, each,	8		

Winter Sorts.

	Votes.		Votes.
Lawrence,	15	Josephine de Malines, Columbia, Beurre Gris d'Hiver Nouveau, each	2
Winter Nelis,	11	Belle Williams, Aremberg, Duc d'Bordeaux, Beurre Bachelier, Alencon, Jaminette, and Jones' Seedling, each	1
Easter Beurre,	8		
Winkfield,	5		
Glout Morceau,	3		

Doyenne d'Ete—C. L. Hoag had found it to crack for the past two years. H. E. Hooker found it to succeed poorly on the quince—overbearing and not proving good. Dr. Sylvester thought that by thinning, this evil might be avoided; while it bears so early, that we may have the fruit almost as soon, if not quite as soon as planted. The only objection to the *Giffard* was its early decaying—which others stated could be prevented by picking early. The same remark was made by several other members in relation to the *Osband's Summer*. This sort, H. E. Hooker said, was not a good bearer, and G. Ellwanger regarded it as of very moderate quality. Several members had found it to bear well only on quince, while a few had it bear abundantly on pear stock. The *Brandywine* had not been extensively tried; a few members had found it a poor bearer. The *Tyson* was highly commended by all who spoke of it. C. L. Hoag of Lockport, said it was remarkably exempt from blight. The *Bloodgood* was not rated high by members, and some thought it should be discarded. P. Barry however, who had a bearing tree for 25 years, had found it uniformly good. The *Rostiezer* was universally commended; the only objection was its tendency to blight. The *Washington* had proved valuable and reliable by the few who had tried—bearing very early on pear stock, and succeeding on no others. The *Buffum* has proved very hardy, a handsome grower, exceedingly productive, and when picked before fully ripe, of fine quality. The tendency of the *Belle Lucrative* to overbear, and as a consequence to become insipid,—and its variable tendency from highest quality to poor,—were the objections mentioned by many, while others always found it good. The *Beurre d'Anjou* appeared

to have no defects, except that of insipidity on young trees, which however disappeared as the trees became older. *Beurre Diel* had proved a fine rich but slightly coarse pear—valuable for its lateness, but apt to spot: young trees and dwarfs moderate bearers, but old standard trees bearing abundantly. W. Sharp of Lockport, had been able to obtain only $18 a bushel for it in New-York, on account of the spots, while the Lawrence brought $24. No objection was made to the *Seckel, Sheldon, Angouleme,* and *Louise Bonne of Jersey,* except that the flavor of the latter was not of highest character, while its fine growth and great productiveness placed it high for general value. Several cultivators had found it the most profitable pear for market. The *Flemish Beauty* appeared to be waning somewhat in reputation—cracking badly with several members—although of the highest value at the West. The *Beurre Bosc* was strongly approved, the only drawback being tenderness of the tree.

A Profitable Orchard.—Thorough preparation and good management are the most economical, even in the fertile regions of the West. The following description of a young orchard is given in the Country Gentlemen by E. H. Skinner, of McHenry county, Ill., a widely known and successful cultivator of fruit. The description would not be less striking if one could be added representing some other orchards managed on the slip-shod principle, growing among weeds and grass, dying from want of cultivation and broken down and browsed by cattle:

My young apple orchard of five acres I wrote you about, set three years ago this November, was this fall a sight to look at. We gathered 103 bushels of Wagener and 14½ barrels of New-York Pippin (Ben Davis) from it, and sold at five dollars per barrel as soon as gathered.

This should be enough to convince sensible people that *it pays to subsoil and prepare land thoroughly for an orchard!* This orchard of five acres has already paid for itself, and I would to-day refuse $1,500, were it offered me for it. Have just sold ten acres of orchard set out six years, for $200 per acre. This we call a good orchard, though it can never equal the one above mentioned, simply for want of first preparing the land. What I once called good preparation I now call "slip-shod."

My dear sir, the facts are simply these—to have an extra orchard, we must go to the bottom and make the whole field as mellow as a garden bed, *not less than twenty inches deep.* We were at this kind of work when it froze up, with four men, four teams and two plows, and could not fit up more than half an acre per day. Some, as they pass by, laugh at me for my extravagant notions as they call them, or my "one idea," but I have shown them this summer that one good idea is better than a dozen poor ones. On one acre and nineteen rods of land I raised 162½ barrels of extra apples, getting an extra price for them. This acre and nineteen rods netts over $1,000—one thousand dollars! *Whose corn-field pays better?* Nearly one-third sold at eight dollars per barrel, and most of the balance at seven

dollars per barrel. The variety, Carolina Red June, is one that has been thrown out by some cultivators simply for want of proper cultivation. Without cultivation it is one month later in ripening, and worthless here. With good cultivation it is a good apple; with extra cultivation it is an extra apple. It only wants good feeding.

APPLES FOR MARKET.—Among the varieties in whose favor a large vote has been given by experienced cultivators for Erie, Pa., are the following: Baldwin, Rhode Island Greening, Jonathan, Roxbury Russett, Westfield Seek-no-further—and less tested, Tompkins County King and Northern Spy. Various cultivators have other favorites.

BEST VARIETIES OF HARDY GRAPES.—The Fruit Growers' Society of Western New-York, took a vote from its members on the best varieties of the grape for succession, in that district. Thirty-one ballots were given with the following result:

	Votes.		Votes.
Delaware,	20	Rebecca,	21
Diana,	26	Concord,	14
Isabella,	25	Creveling,	12
Hartford Prolific,	23	Catawba,	9
Iona, Perkins, Allen's Hybrid, To Kalon, and Northern Muscadine, each.	2	Lydia, Adirondac and Israella, each..	1

THE BEST STRAWBERRIES FOR FAMILY USE.—At the summer meeting of the Fruit Growers' Society of Western New-York, at Rochester in 1865, a ballot was taken for the best 6 varieties for family use, and resulted in the following vote—those receiving the highest number would, of course, be understood as being the more general favorites in Western New-York—33 votes being given in all:

	Votes.		Votes.
Triomphe de Gand,	30	Jenny Lind,	4
Early Scarlet,	26	Crimson Cone, for Canning,	3
Russell and Wilson, each	23	Agriculturist,	3
Hooker,	22	Buffalo, Austin and Longworth, each.	2
Burr's New Pine	12	Red Alpine, White Alpine, Cutter's Seedling, Jenny's Seedling, Genesee, and La Constante, each	1
Hovey's Seedling,	8		
Victoria and Brighton Pine, each	5		

PLOWING AMONG TREES.—In plowing orchards, in addition to the usual precaution of using oxen, or one horse placed before the other ad tandem, use a plow with a movable beam, set so as to run as far to the left as possible when plowing away *from* the trees, and set so as to run to the right when plowing up *towards* them.

RASPBERRIES.—At the summer meeting of the Fruit Growers' Society of Western New-York, in 1865, H. E. Hooker, a distinguished cultivator of Rochester, named the following as the best six varieties for general cultivation, viz: Brinckle's Orange, Hudson River Antwerp, Franconia, Knevett's Giant, Hornet, and Black Cap. Charles Dowing named Brinckle's Orange, Franconia, Hudson River Antwerp, Vice President French, Fastolff and Clarke, a new variety originated at New Haven. These varieties were generally regarded by the members present, as the best.

RAISING PEACHES FAR NORTH.—L. Bartlett, of Warner, N. H., states that he obtains regular crops of peaches by keeping the branches bent down near the earth where they are confined by hooked wooden pins. The covering of snow protects the fruit-buds from the cold. He has found trees thus treated to ripen fruit ten days earlier than when entirely exposed. Covering such prostrate branches with corn-fodder or with a dense mass of evergreen boughs in the absence of snow has answered equally well. It is more difficult to protect them standing above ground, as they are exposed on all sides to the wind, and do not receive the warmth of the earth.

HORTICULTURAL BREVITIES.—One good Tree or Plant cared for, is worth a dozen poor or neglected.

Hardy Sorts, Low Heads, Moderate Growth for Severe Climates.

Kill the Weeds and keep out the Cattle.

Remember that low heads make much the best trees!

Kill the Worms, and sacredly spare the Birds to help you!

Shade for Summer and Shelter for Winter!

Be not like some, always "trimming up" your trees!

Keep soil mellow and free from weeds around Shrubs and Plants!

Tobacco juice and smoke kills plant lice and injures many men!

Small fruits, remember, commence bearing so soon!

Most cultivated plants thrive poorly in the shade!

Flowers—Emblems of Beauty and Innocence—Earth's kisses, God's smiles.

O! for a spot where Summer smiles and Flowers perennial bloom!

How pleasant and healthful for Ladies to cultivate Flowers.

Botany and living Sciences before dead languages.

Most plants winter best covered with leaves or litter in the fall.

A fine, well-turfed lawn is one of the very handsomest home adornments.

Home, Children, Flowers, Music—true Sweets of Life! F. K. PHŒNIX.

FRUIT TREES OF HANDSOME GROWTH FOR SHADE.—Among the handsomest growing pear trees, that bear fruit of excellent quality and grow rapidly, are Buffum, Howell, Flemish Beauty, and Washington. Skinless is also a rapid grower, but not quite so symmetrical in form. Urbaniste is a handsome tree, but grows rather slowly. Jaminette is a fine grower. Among cherry trees of good form, are Black Tartarian, Burr's Seedling, Coe's Transparent, Napoleon Bigarreau, Downer, Reine Hortense, and Black Heart.

APPLE ORCHARDS.—The best market varieties at present generally cultivated are the Baldwin and Rhode-Island Greening. These stand first on the list of most market orchardists, but others think that the Roxbury Russet for its long keeping and adaptation to spring marketing, will prove more profitable. The Tompkins County King is an excellent and showy apple and sells at high prices, but is less productive than the above. When fruit of very fine quality is more appreciated, the Northern Spy will probably take a high stand. There are several other varieties that may be added to the

above, the value of which cultivators differ upon, such as Peck's Pleasant, Golden Russet, Fall Pippin, Seek-no-Further, Jonathan, Newtown Pippin, Hubbardston Nonsuch, Esopus Spitzenburgh, &c. Trees do best when transplanted when young, say two or three years from graft, not more. Thirty-five feet is a suitable distance asunder. Setting out "natural" trees will do where they happen to be on hand, and where the owner has not certainly fixed on the sorts; and it is also well suited to the northwestern regions of the United States, where severe winters frequently injure or kill trees worked near the surface of the ground.

With regard to markets 15 years hence, we cannot speak with certainty, but rather in relation to present management. Judging, however, from the past, from the rapid increase of population, from the inherent fondness of good fruit in all the human family, from the fact that fruit if not saleable is an excellent feeding for domestic animals, and especially from the fact that fruit on well-managed orchards, thinned and selected, will always bring cash readily, no matter how abundant poorer apples may be, we think that it will not be hazardous to plant more orchards—unless, as is generally the case, they are neglected or but half cared for.

CULTURE OF FLOWERS.

Pink.

The following excellent practical suggestions were kindly furnished us, in reply to inquiries, by C. L. Allen of Brooklyn—one of the most enthusiastic and successful cultivators of flowers with whom we are acquainted.

It has always been hard work for my thoughts and feelings to ooze out at the point of a pen, particularly so when they are dwelliung upon flowers—the purest, sweetest, loveliest things God ever made, except little children. Were I to try I could not do them justice. I cannot even think, much less write, as well as they deserve.

The question is not now whether we are are to have

flowers or not, but when and how to get the best and finest varieties, and what kind of cultivation will bring them nearest perfection. With us in the city, the question is, how shall we manage our two to four hundred square feet of garden so as to have flowers at all times. Most people answer it by going to the greenhouse—buying say $25 worth of plants—put them out—let them dry up and die, and say they don't know what is the trouble, but they cannot raise flowers.

Perfect Rose.

To answer all the questions in full, would be to write a volume, which of course I cannot do—consequently I must dwell briefly on each point:

1st. What is the most common cause of failure? Not having a sufficient love for them to devote the time and attention necessary to obtain a thorough knowledge of their nature and habits. It is as easy to raise a flower as to do any thing else, when you know how.

2d. What are the principal requisites necessary for success? Good soil, good seed, and good care, will in every case produce good flowers, and plenty of them.

3d. What time for sowing—early, late, or medium, &c.? That depends wholly upon what you want to sow; some things *must* be planted early, others must be late. If one rule was to apply to all seeds, I should say the medium by all means. Seeds that are sufficiently hardy to live out all winter, should in all cases be sown as soon as the ground is in order. For Mignionette, Candytuft, Alyssum, Phlox, Drummondii, a succession of sowing

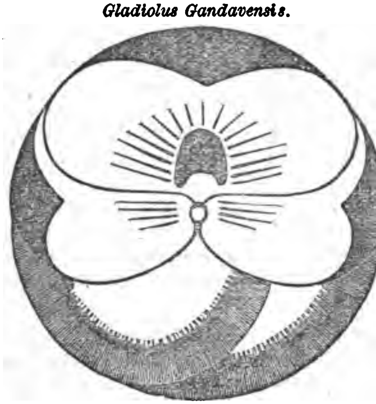
is indispensable. There can be no general rule laid down for sowing—each plant has peculiarities of its own, that demadd special treatment in order to have it succeed well.

Carnation.

4th. What flowers are the most difficult to raise? Those we know the least about. One plant will do as well as another, providing you know how to manage it. I find no difficulty in raising anything I undertake, simply because I will not buy a seed or plant without first finding out whether it is likely to succeed in my soil and situation. By many the Tuberose is considered the most difficult of all our garden pets to manage; there is nothing in my garden that does better, or gives me less trouble. I treat them as follows: Take the flowering bulbs and break off all the offsetts; do not leave a single one; put them in a light friable loam, with a liberal mixture of leaf-mold and well rotted cow manure; in case of drouth give them plenty of water, and the work is done, and you will soon be amply rewarded by delicious perfumes. For early flowering, I start them in pots about the first of 3rd mo. (March.)

5th. What are the most essential points to produce success in germination? That depends altogether on what you want to germinate; in this, as in all other branches of floriculture, knowledge is success. The most common cause of failure is planting too deep; secondly, in not having the soil properly prepared. Some gardeners do not sow, but literally bury their seeds, then cover them with soil too coarse to cover over potatoes, and then, of

Gladiolus Gandavensis.



Pansy.

course, marvel that their seeds do not come up. Do not sow seeds of delicate plants until the ground is warm; do not sow when it is wet; the soil should be nearly dry; put the seed on the top, then sift on through a fine sieve, fine mold to the depth of from one-eighth to one-half inch, according to the size of the seed. Should it remain dry a few days, use the sprinkler, and success is certain. After the seeds have sprouted, rain is all that is needed.

6th. What treatment in growth yields the most satisfactory results? How with regard to pinching in, distance asunder, manuring, shading, &c.? I raise plants on purpose to *pinch* them, and do it as fast as they flower, but at no other time; the more you cut flowers, the more you get; always encourage growth of plant; never dictate the shape it may choose; as for distance asunder, that depends upon circumstances. My ground is completely covered, (or soon will be,) because I want a great variety on a small space. Where there is room, it is decidedly preferable to give each plant sufficient room to grow without crowding its neighbor. Verbenas should be put in rows three feet apart; Balsams, the same; Asters, one and a half feet. As for manuring, that is the most important part of the whole. Flowers must have rich soil to do well. My experience has been somewhat limited, but it has taught me not to expect large re-

turns from small investments. For most plants you cannot use too much. I cover my ground with three inches in depth, every fall, of well rotted cow manure. Do not use it until it is two years old, as plants are too delicate to stand the heat from new manure.

Lilium Longiflorum.

7th. What is the best treatment for Cypress vine? I prepare my ground as fine as possible, sow the seed on top, barely cover them with fine mold, at evening sprinkle with boiling hot water; if the following day bids fair for a "scorcher," cover with a board. They are sure to be nicely up within 48 hours from time of sowing. I cover my fence with that beautiful vine. Should sow in a circle, as I used to do in Union Springs, if I could spare the room.

8th. Please furnish a list, &c.? My choice is as follows:

1. Roses.
2. Tuberoses.
3. Fuchsias.
4. Gladiolus.
5. Asters—Truffaut's are the best.
6. Verbenas.
7. Phlox Drummondii.
8. Heliotrope.
9. Balsams—Smith's or Glenny's are best.
10. Mignionette.
11. Lilies—Japonica, Lancifolium, &c.
12. Alyssum.
13. Candytuft.
14. Pansies.
15. Feverfew.
16. Carnations.
17. China Pinks.
18. Lemon Scented Verbena.
19. Geraniums — Rose, Fish, Lady Washington.
20. Lantanas,
21. Ageratum
22. Spirea.
23. Tigridias.
24. Dielytra.
25. Double Zinnia.

This list comprises those that I cannot do without; of course I have many others. It would be but the commencement of the list if I had room, which some day it may be my good fortune to have.

How to have a Good Lawn.—Make the soil deep, rich and mellow by subsoiling or hand trenching, as circumstances may dictate. If not now fertile, work in thoroughly and intimately a large quantity of fine manure, taking the greatest care that this manure be evenly distributed, or else green spots and patches will disfigure the lawn. Sow very early in spring, and roll or brush in a dense seeding of lawn grass, which may be obtained at Thorburn's and other large city seed stores. It should be applied at the rate of at least two bushels per acre. If sown very early, it will come up quickly and evenly, and should be mown when a few inches high, repeating the process every week through the season, and will in a few weeks furnish a fine, handsome, close turf.

FARMING AND RURAL ECONOMY.

Clover in Rotation.—One of the best courses in which clover is brought in largely, and consequently one in which the soil, whether light or heavy, may be constantly improved, is the following:—

First year.—Clover—collect all the coarse manure in heaps, either to rot down with straw, or to be composted, ready for autumn use. In autumn, spread this over the clover very evenly, to remain and wash into the soil till spring.

Second year.—Turn over the sod in the spring to a medium depth—mellow the surface with Shares' Harrow—mark, and plant the corn. Cultivate as often as once a week from the time the corn is up, until too large for the horse to pass—at least six times in all, or from the middle of June to the end of July, in the Northern States. Hoeing is of secondary importance, and is useless unless the ground is weedy.

Third year.—Plow and sow early in spring with oats, barley or spring wheat, accompanied with a heavy seeding of clover.

Fourth year.—Cut the clover early for hay, and when it has a good second start, turn it under fo wheat. If the land is not very rich, or if it is heavy and liable to heave, spread over the surface a moderate coat of fine manure after the plowing, and harrow it in before seeding.

Fifth year.—Seed down clover again with the wheat.

Six and Seventh years—the land may remain in clover two years, but not longer, when it is again manured in autumn as before, to be plowed for corn the following spring.

If the land is not strong, or if there is not a large supply of manure, the oats, which is rather exhausting, should be omitted in this course, supplying its place with barley, peas or early beans.

Smooth Meadows.—The general use of the mowing machine will, we trust, make a great improvement in the external appearance of farms. Stumps, bushes, stone heaps and obtruding rocks, must disappear. Hillocks and hollows must be reduced or filled up by good plowing and thorough harrowing. The roller must have its share in this improvement. The surface of the land having been cleared of large obstructions and stones, small stones may be pressed into the soil by the use of this implement. Some of our best and neatest farmers make it a rule thus to pass over their meadows every spring. If the soil is light, gravelly, or not adhesive, but little care is necessary, but where clay forms a considerable constituent, caution must be used not to touch the surface when it is so wet as to become crusted by the operation. It should always be so dry that the earth will crumble and not pack. Some have pronounced the roller positively injurious by not observing this care.

RENOVATING OLD MEADOWS.—Where the land admits of a regular rotation, the best renovation is to plow up, manure and re-seed heavily. If lightly seeded, the grass will be coarse and the crop less heavy. A very thick seeding makes a fine feed, like that from old grass lands.

If the land cannot be plowed, an excellent mode is to harrow the surface thoroughly with a very sharp harrow, early in spring, when the soil will crumble finely, and sow grass seed. If the surface has been coated with fine manure the previous autumn, the seed will take with more certainty, and the growth be much stronger. In addition to this, a fine, even top-dressing the following autumn will be a great improvement. Scattering the manure in lumps, or spreading coarse stuff, will be of little use, unless afterwards finely broken up and evenly spread. The top-dressing should be repeated as the fertility of the soil may require, once in one to three years. If the surface tends to produce the growth of moss, the addition of lime or ashes with the top-dressing, and before the harrowing, will be useful.

THICK SEEDING CLOVER.—A correspondent of the COUNTRY GENTLEMEN, in Orleans county, N. Y., says that while he has seen grain sown so thickly as to fail in securing a good plump seed, he has never seen clover so thick as to make any difference in the quality of the seed. He finds that a peck of clover seed and half a peck of timothy are not too much, but succeed better than a smaller amount. The second growth is always less branching and more uniform than the first growth.

FIRE-PROOF SHINGLES.—J. Mears states in the Boston Cultivator, that after an experience of eleven years, and using seven forges in his blacksmith shop, he has never seen a shingle on fire nor has a nail started. White-wash was made in a large trough, of a bushel of lime, half a bushel of salt, and five or six pounds of potash. The shingles were set in up to the bands for two hours, and then turned end for end. When laid on the roof they were brushed over at intervals of two or three years after. Quite dry shingles would absorb this wash the best, and with the bunches opened.

GRAIN SCOOP.—A correspondent of the Genesee Farmer has successfully used a grain scoop for filling bags made as shown in fig. 1. One hand grasps the bow handle and the other handle at the end. A half bushel is easily scooped up at one operation, and the bags filled in one-half the time required in using the common scoop shovel.

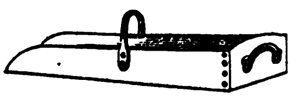


Fig. 1.—*Grain Scoop.*

CORN FODDER IN DRILLS.—H. S. Collins of Conn., states that he can grow twice as much corn fodder on an acre of land, by sowing it in thick drills three feet apart, and cultivating twice, as by simple broadcast sowing. Our own experiments give a result in favor of drills nearly as great as this, besides leaving the ground clean.

MANURE FROM COWS.—S. Williams of Waterloo, keeps this kind of manure perfectly loose and easily scattered and spread for garden purposes, by

using turner's hard wood shavings for bedding. These prevent the manure from becoming compressed and hardened into a solid mass.

Contrivance for Hiving Bees, (fig. 2.)—Take a board as large as the bottom of the hive, bore a number of holes through it, and insert corn cobs through these holes; then nail securely a handle 8 or 10 feet long, to this board. Nail a narrow board so as to form a sort of hood over the cobs when it is set up. Make a slanting hole with a crow-bar in the ground, and thrust the pole or handle into this hole. If these cobs are dyed of a dark brown color, the bees will be almost sure to light upon them. But should they light on the branch of a tree a few gentle taps against the limb, will induce them to leave it and adhere to the cobs. These, from their rough surface, will enable the bees to hold on firmly. When they have settled, take out the pole, lay the instrument flat, and place the hive on the board which holds the swarm, and the thing is done. In large apiaries two or three of these may be on hand for use.

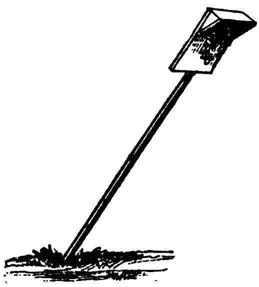


Fig. 2.—*Bee hiver—made of board with corn-cobs set in.*

Drill Cultivation.—The great scarcity of labor in this country should induce farmers to resort to a more rapid and wholesale mode of cultivating their crops. A horse which takes but one row at a time, requiring one man's entire attention, can not perform labor profitably, although this may be the only mode for rough, stony, or imperfectly cultivated land. If stones, roots and other obstructions are all removed, and the soil made uniformly fine and mellow, a better system of management may be adopted. The crops may be planted in perfectly straight and parallel rows by drilling machines, and in cultivation several rows taken at once. In England, Garrett's horse-hoe is successfully used for this purpose, dressing out at once many rows of root-crops, and cleaning a strip seven or eight feet wide at a passing. The drills being perfectly parallel, in consequence of having been planted by a machine, all that is necessary in cultivating with Garret' s horse-hoe is for the operator to watch a single row only, and guide the blades within an inch of this row. The others all do the same. This implement is not only used for roots, beans, &c., but in the cultivation of drilled wheat. It is used first when the plants are only an inch high, and not only cuts up the weeds, but accelerates the growth of the crop by the pulverization of the soil. Its use is discontinued when the roots have extended so as to fill the spaces between the rows—although doubtless even at this time, a surface-dressing would do more good than harm.

Piling Cord Wood.—In piling cord wood place the bark side upward, as it will then turn off the water, keeping the wood dryer, and preventing the bark from dropping off and being lost when it is moved.

UTILITY OF CLOVER ROOTS.—On all compact, heavy and tenacious soils there is nothing better than a crop of clover to loosen and render it friable. Any one who has seen the difference between the state of pulverization in every inverted piece of sward land where only timothy and other similar grasses have grown, and where a dense mass of clover roots have struck down deeply and penetrated every part, will need no further argument on this subject. The fertilizing effect of the clover crop is also one of its most important advantages.

GAS TAR.—The advantages of this material as a preservative of all porous woods, where exposed to much moisture, cannot be too fully appreciated. We know an instance where a common pine vat, constantly exposed to moisture and air, rotted in two years; it was replaced by another, coated when very dry and warm, with two applications of hot coal tar; after the lapse of 15 years it is still sound. Fence posts might doubtless be rendered very durable by first seasoning thoroughly, and then immersing 2 or 3 feet of the lower ends, for a few minutes, in a large kettle or cauldron of coal tar. For the more porous kinds of cedar and other woods, into the pores of which the tar could penetrate freely, it would be most valuable.

This material is also excellent for all mortices, joints of gates and of the boards in fences where decay is otherwise apt to commence soonest. The only objection to its use on fully exposed surfaces, is that the black color absorbs the sun's rays too freely, and, by heating, tends to produce warping and cracking. For such purposes lime-wash is valuable.

APPLES FOR STOCK.—Never throw away windfalls or poor apples, or allow them to waste, no matter how abundant the crop may be. Moderate and regular quantities fed to milch cows late in the fall and in winter, will improve their condition and appearance, and increase their milk. The health of horses will be improved by a portion of this succulent food, when confined to hay and grain. The richer sorts of apples are excellent for fattening and keeping store-pigs. Fed to sheep in connection with hay and grain, they produce an excellent effect. Provide, therefore, ample dry bins in your barn and other cellars for storing these refuse apples, and they will save a vast amount of grain.

MATERIALS FOR REPAIRS.—Every farmer, and especially those who are some distance from mechanics' shops, should be well provided with all the usual materials for repairing tools, implements, &c., as the delay in their use is often many times greater than the cost of putting them in order. Provide boxes with apartments, and purchase at hardware stores a supply of screws and nails of different sizes, screw-bolts with nuts, and nuts alone, rivets, coarse and fine annealed iron wire, copper wire and pieces of copper straps, common and tarred cord, twine, scraps of leather, paint with paint brushes, varnish and all the necessary tools. The great flexibility of copper wire and copper straps render them very useful on many occasions.

ROTATION.—1. Corn, with all the coarse winter manure. 2. Peas or bar-

ley. 3. Wheat, with a top-dressing of fine manure or compost, to be followed by clover, and then corn again. On very strong soils, oats may take the place of barley. We have known this rotation to be varied by allowing the clover to remain one year, and then to turn it over and sow wheat with clover—the second crop of clover to remain two or three years, to be inverted for corn as before.

Corn Fodder.—Corn fodder is very liable to heat or become mouldy, unless packed away where it can receive constant ventilation, the mode of which must be according to circumstances. If in stacks, the stacks should be small, with three or four poles or rails set upright in the centre, to form a chimney for the hot air to escape. If packed away in barns, it must not be in large masses. Large varieties of corn, with coarse stalks, usually form crevices enough for some air to circulate; but small corn with fine stalks, and especially corn sown thick for fodder, packs very solidly together; and there is always enough juice in the stalks themselves, no matter how dry the leaves may be, to produce heating.

Remedy for Birds Pulling Corn.—I have almost entirely prevented the birds from taking up corn this season, by sowing *soaked* corn liberally around the planted field, especially near grass fields, where our red-winged black birds are most plenty. This season has been especially troublesome on account of the frequent showers keeping the ground soft, so that the birds could easily pull up the young corn. But although I planted my corn without any tar, and used no gun or poison, by liberal feeding, they did not make me one hour's work in re-planting 18 acres.

Value of Leaves.—The time will come when the value of fallen leaves for littering stables, mulching the ground, and protecting tender plants, will be better understood than at present. For littering stables, they have one great advantage over straw. Their broad surface and the stratified position in which they always arrange themselves, not only effectually exclude cold currents of air, but render them more perfect non-conductors, and exclude the cold better than any other similar substance. They make a fine soft bedding for horses; and as a component part of manure are not so coarse as straw, and soon decay, giving a fine texture to the compost they form. They impart similar advantages when used as a mulch, namely, lightness of covering and perfect protection. For covering tender plants they are peculiarly fitted—being always so dry as not to suffocate or rot the plant, and the thin plates of air interposed between them, entirely excluding frost if sufficient depth is given. A late number of the Genesee Farmer mentions the case of a gardener who has had remarkable success with roses, the tender kinds of which he keeps through the winter in open ground by a thorough covering with leaves. When a foot in thickness, with a few branches of evergreens on the top to prevent them from blowing away, no frost can penetrate them.

Many farmers have a large supply of leaves in their woods in hollows or low places; the winds will sometimes sweep them into heaps two or three

feet in thickness, and they may be scooped up with large baskets, and drawn in double-topped wagon boxes with great facility. In any woods they are easily and rapidly raked into heaps for the same purpose. It often happens when there is no snow on the ground in the winter, that farmers can draw leaves better than at any other time. In portions of the country where snow has not fallen, and where forest leaves are abundant, the work should not be omitted. The scarcity of fodder, and the consequent value of straw renders it especially desirable at the present time to save and use to the best advantage everything of the kind.

CELLAR DRAINS.

To secure sufficient drainage, add to prevent the channels from becoming choked by sediment, much depends on the form of the bottom of the channel. We had recently occasion to take up and repair a cellar drain which had become obstructed, and had ceased to discharge water; and found the difficulty to result chiefly from a flat bottom, formed by placing horse-shoe tile in the usual manner on a plank bottom, as shown in fig. 1. The water which had passed into the drain, spread itself over the whole bottom; the current was shallow and week, and was incapable of carrying off the small particles of solid matter which it contained, and they were deposited, as a necessary consequence, in the bottom. Successive layers finally choked the whole channel.

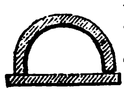


Fig. 1.—*Horse-shoe tile wrongly placed.*

Channels for a similar purpose, either above or below ground, are frequently made of boards or plank alone, with a flat bottom, and with a similar result. Had the *corner* instead of the flat side, been placed downwards, the water would have been thrown together or concentrated, and instead of depositing sediment, would have swept it off freely, and left the channel clear. The accompanying figures show this result distinctly; the first (fig. 2) representing the water as spread over the flat bottom, and the second (fig. 3) the same amount of water collected together in the angle formed by placing the boards in a different position.

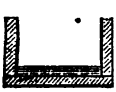


Fig. 2.—*Box-channel wrongly placed.*

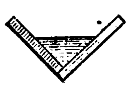


Fig 3—*Box channel properly set.*

In constructing a drain for similar purposes of *tile*, the curved portion should always be placed below. If horse-shoe tile is used, it should be inverted, (fig. 4,) and covered with a stout sole, flat stone or plank. If tubular or pipe tile (fig. 5) is employed, no difficulty will occur—although the results will be less striking than in an angle—and a small tile will be better than one too large.

Fig. 4—*Inverted horse-shoe.*

Fig. 5—*Tubular tile.*

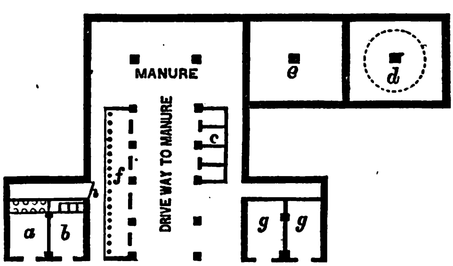
These precautions are not required in common land drainage, as the water, before entering, becomes thoroughly filtered, provided the drains are deep

enough. They should be entirely beyond the reach of frost, which, by disturbing the soil, always produces some muddy water. In loose or porous soils, the depth should be greater than in those of a compact or clayey nature. In this latitude the depth should never be less than three feet for the former, nor less than two and a half for the latter.

DESIGN OF A BASEMENT BARN.

BY W. J. MORRIS, NEAR FAIR-HAVEN, CONN.

The arrangements are entirely my own, and I think very convenient. When you are in at any door you are prepared to go into any part of the building without going from under cover. The barnyard is exactly south of the barn—contains 4,800 square feet—the barn cellar 3,200 square feet. The barnyard wall is built of stone, 60 by 80 feet, with gate on each southeast and southwest corner—is 4 feet high, 18 inches thick at the top, 30 inches at the bottom, laid in lime mortar and the top cemented.

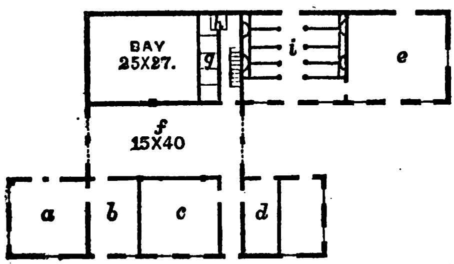


CELLAR TO BARN.—*a*, hen house—*b*, calf pen—*c*, root bins—*d*, cistern under carriage house—*e*, underpinning to horse stable—*f*, cow stalls, with stanchions—*g g*, pig pens—*h*, slide for cattle fodder.

The root bins are built double sided. The cow stalls are on the plan of those of Isaac Garret, Esq. of Delaware county, Pa., mentioned in the Co. GENT. of July 10, 1862. The pig pens and troughs are the same as

those mentioned in Co. GENT., vol. 12, page 234. In addition to the cistern, I have a supply of water for the entire basement, brought in pipes from a spring about 1,800 feet distant.

My manurial resources I consider excellent. On the 15th of Nov., 1861, I commenced a drain from a muck pond—laid a 6 inch glazed pipe with cemented joints a distantance of 700 feet—the greatest depth excavated was 20 feet 6 inches—the least depth 8 feet 6 inches—most of the distance had to be curbed. The surface of the pond is about 5 acres in extent, and the depth of the muck is from 3 to 12 or 15 feet. The pipe is laid with a fall of 6 inches per 100 feet, and drains the pond 4½ feet below the surface of the muck. Owing to the bad weather this was not completed until the next April. When the water was let on to the pipe there was discharged in the first twenty-four hours about 2,500 hogsheads, or 100 hogsheads per hour. I am now hauling out the muck, and think it will tell a good tale in returns of grain and grass.



PRINCIPAL FLOOR TO BARN.—*a*, large tools and implements—*b*. room for cutting feed—*c*, bay—*d*, small tools—*e*, carpenter shop—*f*, threshing floor—*g*, grain bins—*h*, water closet—*i*, horse stables—*k*, carriage house.

DOMESTIC ECONOMY.

Keeping Grapes in Winter.—The following brief statement of the the discussions which took place at the meeting of the Fruit Growers' Society last winter contains several valuable suggestions in relation to this subject:

The discussion was opened with remarks on the best mode of keeping grapes. Judge Larowe of Steuben Co., had kept grapes till the middle of July as follows: He uses crocks or jars holding about 2 gallons; laid a round board in the bottom, filled with grapes, and then sealed them air tight with a compound of rosin and tallow. They were placed in a cold room and allowed to remain there, unless the thermometer is likely to run down to zero, when they are carried to the cellar. It is important to have the grapes well ripened, in which case they will not freeze nearly so easily as apples. G. Ellwanger had never succeeded till he had kept his grapes in the barn by first packing them in 12 and 24 lb. boxes, and as soon as danger from frost occurs, placing them in very large boxes, encased all around with a stratum of dry leaves a foot thick—under, around, and above them. Most agreed on the importance of packing them away in good, well ripened, (but not over ripe) condition, with the removal of all the imperfect berries. H. N. Langworthy had found the Rebecca to keep better when not too ripe or dead

ripe. Dr. Sylvester had found three important requisites in keeping grapes, viz., perfect maturity, coolness of temperature and as dry an air as possible. Judge Larowe was very emphatic in favor of perfect maturity for good keeping. He said the cheaper way was first to cure them, or evaporate the moisture, and then pack them away with alternating layers of straw, in boxes or shelves. They would thus keep till April. Mr. Olmsted of Genesee Co., kept them in drawers holding 25 pounds each, in a cool room, one box piled on another. He had found them thus to to keep nearly as well as apples—they do not freeze so easily as apples. He said a neighbor has a cellar half above ground, where he keeps them in large quantity on racks. He finds the Isabella, Diana and Rebecca to keep best.

Keeping Eggs.—The great point in keeping eggs is to have them *stand on end*--some housekeepers are very sure that it is quite indispensable that the small end should be down; others are equally sure that they should rest on the large end. Both are very successful. They may be packed in oats, dry sawdust, or any other material that will hold them in this position. They should be kept in a cool, dry room.

Making Vinegar.—Vinegar is made from cider by exposing it in barrels not quite full, with the bung open, in a warm place, as the south side of a building, to the full action of the sun's rays. The addition of a quart or two, or even a gallon of molasses to each barrel, hastens fermentation, and makes better vinegar. The addition of a sheet of brown paper placed upon the surface also hastens fermentation, by giving additional facility to the action of the air. The mother in vinegar consists of the concrete organic matter in the cider, which promotes fermentation, and then settles to the bottom in a sort of gelatinous mass. We suppose the old-fashioned way of separating the vinegar from it, described by Dean Swift, is as good as any, namely—

"First rack slow, then rack quick,
Then rack slow till you come to the thick."

Purifying by distillation makes the vinegar nearly colorless, but this mode is only adopted for druggists. Vinegar is sometimes manufactured in the course of a day or two with great rapidity, by allowing it to trickle through small holes in the bottom of a pan placed on the top of and fitting a barrel, which is filled with shavings. The vinegar runs down the surface of the shavings, and is thus thinly exposed to the air, which causes a rapid fermentation, completing the process, if skillfully conducted, in forty eight hours.

How to Make a Foot Muff.—Those who take long rides in winter, are often obliged to resort to artificial means to keep their feet warm; hence hot bricks, heated blocks of wood and jugs filled with hot water are variously used. The foot muff is a great improvement on all these. It may be made in different ways, one of the cheapest and most simple of which is as follows: Let the tinman, make a square box, about one foot square, and two inches thick, so as to hold water. A screw, turned by a button, is inserted into one of the narrow sides —the screw hole should be large enough to admit a funnel. The box should be perfectly water-tight, the screw hole being the only place for the admission and and egress of the water. If a suitable screw cannot be procured, solder in a short tin tube, about an inch long, to receive a cork, which is to be tightly pressed in. This box, when filled with hot water, which may be done in a few seconds, will retain heat a long time; but its efficiency may be greatly increased by encasing it with the muff. The box itself may be first covered with a piece of coarse carpeting, and then a sheep skin, tanned with the wool on, sewed on the upper large flat side of the box, somewhat in the form of a broad shoe, with the wool inwards, and large enough to receive both feet. This essentially completes the foot-muff. The more expensive ones are covered with furs instead of sheepskin; and if the skin extends around the whole box, the heat of the water will be retained a longer time. A well made muff of this kind, filled with hot water and placed in the bottom of a sleigh, will continue warm for half a day.